



Digitized by the Internet Archive
in 2022 with funding from
University of Toronto

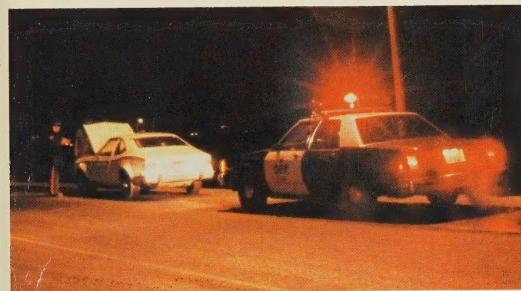
<https://archive.org/details/31761115466666>

CAZON
EP
A55

Carrie &
Pamela

DISPOSITION LIST OF MATERIAL.

ONTARIO HYDRO ANNUAL REPORT 1980



RS

the Board

caulay

an

wker

h

ice-Presidents

Campbell

ice-President

erg

ice-President

Administration

ents

Coles

ent

& Marketing

omer

nt

ton

ent

rvices

ackson

ent

onstruction

athew

ent

m Program

cCarthy

ent

elations

Connell

ent

& Transmission

mith, M.B.E., F.R.S.C.

ent

gments

d General Counsel

Raney, Q.C.

omptroller

Burdette

REGIONAL DIRECTOR

Central Region

C. S. Elliott

5760 Yonge Street

Willowdale M2M 3T7

Eastern Region

P. J. Garlough

420 Dundas St. East

Belleville K8N 5C3

Georgian Bay Region

F. A. Pertula

93 Bell Farm Road

Barrie L4M 1H1

Niagara Region

J. W. H. Kerr

Box 157, 1053 Main St. West

Hamilton L8N 3B9

Northeastern Region

H. K. Wright

590 Graham Drive

North Bay P1B 8L4

Northwestern Region

D. D. Haig

34 Cumberland St. North

Thunder Bay P7A 4L5

Western Region

E. G. Bainbridge

1075 Wellington Road

London N6E 1M1

REPORT OF THE BOARD OF DIRECTORS OF ONTARIO HYDRO FOR THE YEAR 1980

To The Honourable Robert Welch,
Minister of Energy

We, the Board of Directors, submit to you this report of the financial position and relevant Ontario Hydro activities for the year 1980. We would like to thank you and the staff of the Ministry of Energy for the cooperation and understanding extended during the year. Finally, since the publication of this report coincides with Hydro's 75th anniversary, we direct your attention to the brief history of the Corporation carried as a supplement to this report.

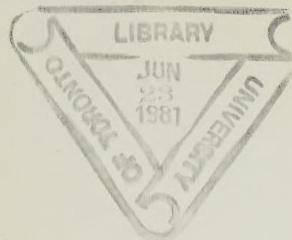
On behalf of the Board



Hugh L. Macaulay
May, 1981

THE COVER

The essentiality of electricity in our day-to-day lives is often taken for granted. We tend to forget its importance in our homes, industries, hospitals and on our streets and highways. It is also an important ingredient in the recreation and entertainment that bring relief to the problems of everyday living. The cover reflects some of the principal photographs contained in this report, all of which remind us that electricity has become an essential part of modern life.



THE CHAIRMAN COMMENTS . . .

Hydro's new challenges

oil prices soaring and world prices lessening, Ontario — and Canada — must seek alternative energy sources to heat our homes, fuel our cars and drive our industries. Without doubt, electricity is one of those alternatives, especially here in Ontario where two-thirds of our electricity is generated from sources indigenous to the province — water power and uranium. Recent provincial government initiatives point in that direction and Hydro is capable of meeting that challenge. The question is: how long will it take for the off-oil initiatives to take root, and to what extent will the oil-hovers occur? Our current surplus generating capacity will take care of an immediate increase in demand. And the government's direction to speed up completion of Darlington nuclear station ensures the province of an ample supply of electricity 10 years from now. The price of oil and natural gas will be a major determining factor in any switch to electricity for home heating. Oil is surpassing electricity in price. At the present rate of price escalation, we expect gas prices to exceed electricity by the end of the decade. But homeowners will hesitate before considering a switch without knowing what they are getting into. Because of this, Hydro is preparing a marketing plan that will inform homeowners with reliable information concerning energy efficiency in the home, new products and services, and advice about their appliances. As well as encouraging electric space heating, the government has invested in the electrification of the GO train rail system, the production of



Hydro Chairman Hugh Macaulay (right) turned over the keys to one of 12 electric vehicles being tested by Hydro to Ontario Premier William Davis, who said his drive was "comfortable . . . fun."

steam from Hydro generators for industrial use and the expansion of our hydro-electric capacity. Ontario Hydro has 75 years of dependable and dedicated service behind it. We can, and will, adapt to these new challenges.

On transmission limitations

We have enough power, but our ability to deliver it suffers some severe limitations. Put simply, our transmission lines, especially in the southwest, are nearing capacity and are incapable of carrying all the new, cheaper and less polluting generation from our nuclear stations. The last unit of Bruce B nuclear station will be completed in 1987, but the second transmission line from the station is still in the early stages of the public participation process. It now appears doubtful we can obtain local and government approval of the line and complete its construction by 1987; doubtful, that is, unless the approval process can be accelerated. If not, there is some probability that nuclear power will be locked in and we'll have to substitute more expensive coal-fired generation. The need for this line to feed the growing demand in Southwestern Ontario has been established and was accepted by the Royal Commission on Electric Power Planning in its 1980 report. But the situation isn't unique to the southwest. All our systems, including the North and the Ottawa area of Eastern Ontario, need strengthening to meet even the reduced load growth forecasts averaging 3.1 per cent a year to the year 2000. Couple this growth with the new government thrust toward greater use of electricity and it becomes evident we must increase our ability to get power to where it is needed.

On air quality control

We know that emissions from our coal-fired stations are substantial. We know also that Hydro's contribution accounts for only two to six per cent of the total that falls in Ontario's sensitive areas in the form of acid rain. In contrast, about two-thirds can be attributed to U.S. sources. But that fact doesn't give Hydro the right to ignore the problem. Elsewhere in this report is a more detailed account of our actions to date, but I would like to point out here that we've already spent millions of dollars on washed and low sulphur coal, and on blending facilities to reduce our emissions. More importantly, we'll be spending at least another half billion dollars on the problem in the next 10 years. During this time, we'll reduce our acid gas emissions by 50 per cent while at the same time increasing our production of electricity by 50 per cent, including the



Ontario Hydro's Board of Directors share a casual moment. Left to right: President Milan Nastich, J. Dean Muncaster, Chairman Hugh L. Macaulay, A. Ephriam Diamond and Alan B. Cousins.

addition of new coal units. I'd like to emphasize that the 50 per cent reduction program was worked out with the Ministry of the Environment, and the limits it sets on the amount of emissions in 1990 are absolute — we're committed to meeting them no matter what the future may hold — no matter how much coal we may burn. We expect that 20 per cent of the reduction will result from the installation of scrubbers and about 50 per cent from nuclear power replacing coal generation. The balance will come from placing special burners in our large coal-fired stations, increased use of hydro-electric facilities and using more low-sulphur coal. It is going to be an expensive business — one where expectations must be balanced against the willingness of the people of Ontario to pay the increased costs. But unless we take practical measures to clean up our own backyard, we can't expect our neighbours to the south to face up to their share of the responsibility.

On the export of electricity

The export of electricity to the U.S. makes economic sense for Ontario. Over the past three years Hydro has earned about \$440 million in net revenues from export sales — revenues that helped us to hold down rates to our Ontario customers. And those sales also helped reduce Canada's balance of payments with the U.S. Furthermore, we expect to have the capacity available to export a substantial amount of electric energy for at least the next 10 years. We intend to market that power and we have the backing of the Ontario

government to do so. Consequently have applied to the National Energy Board for renewal and expansion of export licenses. Later this year Hydro may be seeking approval to construct a high voltage, direct-current cable in connection under Lake Erie for the transfer of firm power to the General Public Utilities system in Pennsylvania. Stronger interconnections at Niagara Falls are planned, and we are pursuing expanded sales at every opportunity. It is simple good business for Hydro and for our customers.

On costing, pricing and rates

For some time Hydro has been discussing a new costing and pricing system with our customer groups. The objective is an acceptable, equitable system that accurately reflects how customers use electricity and the cost of supplying power to different customers at different times. We had hoped to include this new structure as part of our 1981 rate proposal that would have been implemented in 1982. At the request of some of our customers for more time to study the proposals — which are complicated — this has been postponed for one year. In the matter of Hydro rates, Hydro is able to hold the 1981 increase to 9.4 per cent. We expect that for the next few years any increases Hydro requires will be equal to, or slightly below, the rate of inflation. This has been possible mainly because of the relatively stable cost of Ontario's nuclear and hydroelectric resources, as well as revenues from export sales.

on Hydro's 75th anniversary

cluded with this annual report is a brief history of Hydro's first 75 years. It is the story of the long struggle for public power in Ontario and of the dedication and skills of the men and women who built the system. While we can be proud of the past, we must look at today and the future. The period immediately ahead will call for Ontario Hydro to make many adjustments to meet quickly-changing conditions. And while adapting to those changes, Hydro must continue to plan for the future — to the year 2000 and beyond — for that is the nature of the energy world, where our resources are finite and our demands seemingly infinite. But I believe the dedication of Hydro employees will successfully meet these challenges, and at the electrical system they operate, maintain and improve will serve this province well for years to come. Hydro's history also reflects its long association with the municipal utilities. I am proud to say that a constructive and cordial relationship continues today in our dealings with the Ontario Municipal Electric Association and the Association of Municipal Electrical Utilities.

new appointments

The Hydro Board of Directors appointed Milan Nastich, executive vice-president of planning and administration, to be president, succeeding Doug Gordon, on November 1, 1980. Doug Gordon's 35 years with Hydro stand as a hallmark of service to the public of Ontario. Milan Nastich's appointment followed an extensive search both inside and outside the Corporation by the Board's Management Resources Committee. The new president has a distinguished record of service in his 32 years with Hydro in several branches of the organization. In 1972 he was named assistant general manager, finance — a position he held for two years before becoming vice-president. He became executive vice-president in 1978. His proven administrative record and leadership qualities will serve Hydro in good stead in meet-



Left to right: J. Conrad Lavigne, Robert J. Uffen, William A. Stewart, Sister Mary and William Dodge.



Left to right: Philip B. Lind, Arthur J. Bowker, Allen T. Lambert and William E. Raney, Q.C., Hydro's Secretary and General Counsel.

ing the quickly-changing conditions which we face in the 1980s. His position as executive vice-president, planning and administration was taken over by Arvo Niitenberg. Other new executive office appointments included: Vern

Coles, vice-president, distribution and marketing; John Matthew, vice-president, power system program; Dane MacCarthy, vice-president, corporate relations, and Sam Horton, vice-president, supply and services.

1980 marked the beginning of a new energy-use strategy

The first year of the 1980s was a critical one in the 75-year history of Ontario Hydro because it marked the beginning of a new energy-use strategy and a renewed awareness of the importance of electricity in Ontario's economy.

The shift in energy-use strategy was prompted by the provincial government's determination to reduce Ontario's dependence on oil — whether foreign or Canadian — and a commitment to the development of energy from alternative sources.

This heralds a renewed thrust for Hydro for the eventual provision of electrical power to replace costly oil in the transportation and space heating sectors.

However, total electricity use in

Ontario during 1980 continued to reflect conservation efforts as well as the slow growth in economic activity and creeping inflation. Primary energy demand in 1980 was 100.2 billion kilowatt-hours, compared to 98.1 billion kilowatt-hours in 1979 — an increase of 2.1 per cent compared to 2.9 per cent in 1979.

While this demand is the largest in Ontario Hydro's history, revised forecasts issued in January, 1981 show annual electricity demands in Ontario growing at an average 3.1 per cent until the year 2000. This is down from the 1980 forecast of annual growth of 3.4 per cent.

The major source of Hydro generation continued to be water power during 1980, providing 36.7 billion kilowatt-

hours, or 35 per cent of the total energy generated.

Nuclear power, however, was a very close second as the outstanding performance of the CANDU system continued during the year. Nuclear electricity production increased from 32.3 billion kilowatt-hours recorded in 1979 to 35.5 billion kilowatt-hours, an increase of three per cent to 34 per cent of the total energy generated. It was also the second year in a row that nuclear generation outpaced fossil-fuelled generation (coal, oil and natural gas) which accounted for 30 per cent of the total production.

The year 1980 was also a banner year for Ontario Hydro's eight nuclear reactors at Pickering and Bruce generating stations, which took the four top places among 114 world reactors with capacities exceeding 500,000 kilowatts.

Again in 1980, as in the previous year, the peak demand for electricity came on December 17, reaching a new all-time high of 16,808,000 kilowatts — up 2.7 per cent from 1979. This peak was about 1.5 per cent lower than the forecast.

Generation Program

Forecasts of a slowing-down of long-term growth to the year 2000 led to a decision by the Board of Directors early in 1980 to stretch out construction of new generating stations planned under Hydro's long-range construction program.

The Board's decision was based on the economics of production and long-term security of supply. The Board also realized that — even with Hydro's lower rate of growth — the estimated peak demand in the year 2000 would nearly double the 1980 demand.

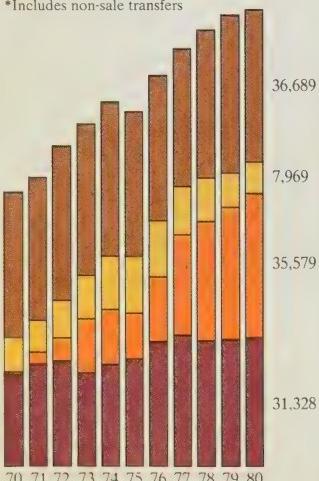
During the year, the provincial government emphasized a broadened energy strategy for Ontario. It announced new initiatives for the

ENERGY MADE AVAILABLE 1970 - 1980

millions of kW·h

Hydraulic	Energy Received*
Nuclear	Fossil

*Includes non-sale transfers



Hydro technologist Bert Worth checks a section of the vacuum building at Pickering nuclear generating station.



Electricity will meet a larger share of the province's energy needs

development of alternate or renewable energy sources from wind, solar power, refuse and wood burning, peat, hydrogen and methane production. By year-end, Ontario Hydro was involved in about 30 such projects, many of them in cooperation with the Ministry of Energy, the Canadian Electrical Association and various schools and industries.

Then, early in 1981, the government announced its Board of Industrial Leadership and Development (BILD) program that called for electricity to meet an increasing share of the province's energy needs. Among other things, the program directed the construction schedule at Darlington nuclear station be accelerated, the electrification of the GO Transit rail system, encouragement of homeowners to switch from heating oil to electricity, a Hydro heat pump rental program and the sale of steam and hot water to industrial and agricultural interests near the Bruce Nuclear Power Development.

Work on the 300,000-kilowatt, two-unit extension of the Thunder Bay thermal generating station continued throughout most of 1980, and by year-end was virtually complete. Turbine testing of both units is expected to be complete by mid-1981. Construction of the 400,000-kilowatt, two-unit, lignite-fired station at Atikokan continued. The two units of this plant are expected to be in-service by 1984 and 1988 respectively.

In the nuclear division, Douglas Point was returned to service at 70 per cent power capacity in October, pending approval for full power operations by the Atomic Energy Control Board. In May, all units at Pickering were shut down to allow inspection of the vacuum building — a prerequisite to preparations for the commissioning of Pickering B station, which is now underway.

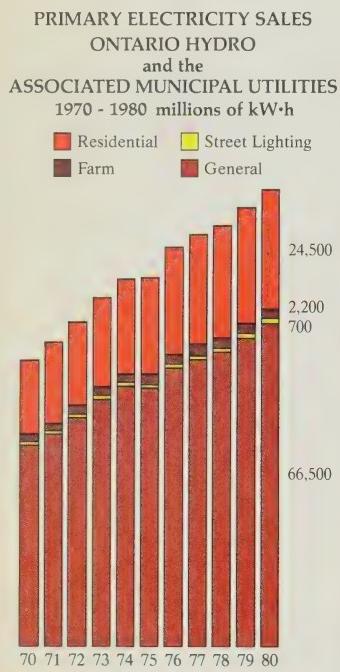
program commenced which will integrate all the engineering activities associated with potential Pickering unit shutdowns in the mid-1980s, to make adjustments or replacements associated with pressure tube elongation and new safety system additions.

At the Bruce Nuclear Power Development, preliminary work commenced on the engineering for a steam line to supply a proposed industrial development adjacent to the site. Also at Bruce, construction of the B generating station was close to plans for a 1983 in-service date for the first of four units, while commercial operation of the Heavy Water Plant B was delayed by material problems. Bruce Heavy Water Plant produced 623 megagrams (687 tons) of reactor-grade heavy water during 1980.

Export Sales

Export sales of electrical energy to the United States fell to 10.7 billion kilowatt-hours in 1980 from a record high of 11.7 billion kilowatt-hours in 1979. The drop is attributed to the slowdown in the automotive industry and transmission limitations in New York State. Despite this decline of eight per cent, net revenues rose to \$162 million, an increase of \$8 million over the previous year, all of which is passed on to Ontario consumers.

Early in 1981 Hydro signed a letter of intent with General Public Utilities of New Jersey, calling for delivery of the total output from J. Clark Keith ge-



ENERGY MADE AVAILABLE: 1980

	1980 Millions of kW·h	1979 Millions of kW·h	% Change Over 1979	% of Total 1980	% of Total 1979
Hydraulic	36,689	38,780	- 5.4	32.9	35.1
Thermal (coal)	30,934	28,540	+ 8.4	27.7	25.8
Thermal (natural gas)	404	1,481	-72.7	0.4	1.3
Thermal (oil)	-10	904	-	-	0.8
Thermal (nuclear)	35,579	32,322	+10.1	31.9	29.2
Total Generation	103,596	102,027	+ 1.5	92.9	92.2
Energy Received*	7,969	8,602	- 7.4	7.1	7.8
Total energy made available	111,565	110,629	+ 0.8	100.0	100.0

*Includes non-sale transfers.



The stranded motorist can appreciate two forms of protection — one provided by a friendly presence of an Ontario Provincial Police officer, the other the welcome glow of a lamp standard when his car developed engine trouble.

Hydro activities continued to be a subject of great public interest

ating station to the U.S. utility. If reached, the agreement could benefit Hydro's customers in the order of \$5 million a year.

Conservation

Ontario Hydro's energy conservation program continued to emphasize the wise and efficient use of electricity through advertising, seminars and other information programs. In cooperation with the Ministry of Energy, a pilot residential energy audit was carried out in 300 homes in the Town of Aurora. A second energy audit project is under way in Brampton.

Development of the Oshawa and Scarborough field trials for customer load control and distribution system automation continued in 1980. Installation of load control and monitoring equipment was near completion in 400 homes in Oshawa. Computer control and data acquisition facilities were installed to demonstrate the various

load management techniques. Monitoring and scheduling of customer loads will begin in 1981.

Results of this monitoring program will improve the efficiency of the existing electrical system in the province and reduce the need for new generating facilities in the future. One way to accomplish this is to attempt to shift some customers' electricity needs from the period of high demand to the period of low demand (11 p.m. to 7 a.m.). This technique is called "load management."

In addition, Hydro took part in solar-assisted water heater and solar home demonstration programs. It also provided spot-checking to ensure compliance with Canadian Standards Association's heat pump installation standards.

Public Hearings

During 1980 Ontario Hydro continued to be one of the most scrutinized public utilities in the world. During the year

public hearings involved 38,834 staff hours with a related cost of about \$1 million. These hours included preparing information for and attending hearings of Ontario's Select Committee on Hydro Affairs studying the safety of nuclear reactors and the management of nuclear fuel wastes, and Ontario Energy Board hearings into Hydro's application for increased bulk power rates in 1981. Preparations were also made for 1981 hearings by the provincial Environmental Assessment Board and the National Energy Board. Since 1974, when public review of Hydro rates was first instituted by government, Hydro's directly related costs for public hearings have been about \$14 million.

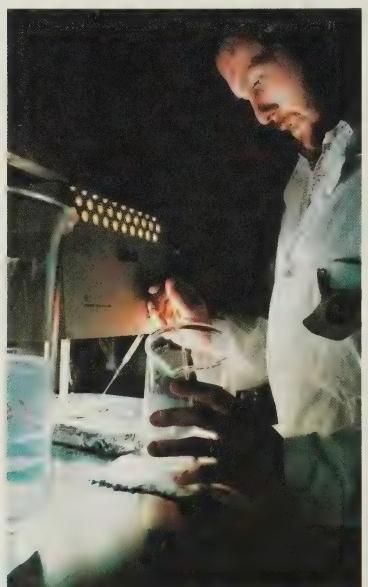
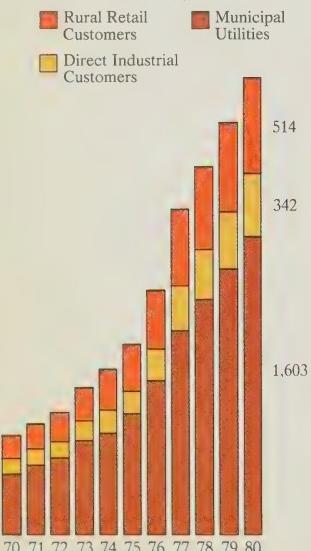
Early in 1980 the select committee concluded that Hydro's nuclear reactors are "acceptably safe", while its final report tabled in June contained 24 recommendations. This report was seen to buttress the earlier report from Dr. Arthur Porter's Royal Commission on Electric Power Planning, which concluded after a five-year study that the use of nuclear power is essential to Ontario. It also urged steps to build public confidence in the safety of its use.

Customers, Rates and Costs

In 1980, the Ontario Government announced the allocation of \$20 million from provincial revenue to Ontario Hydro to reduce the electric bills of year-round rural residential customers in 1981. It is step one in the program to reduce the rural/municipal residential rate differential. For most year-round residents, the reduction will be about \$3.00 per month and brings the differential from an estimated average of 18 per cent to about 20 per cent.

Increases in wholesale power rates announced in 1980 following public hearings by the Ontario Energy Board were implemented on January 1, 1981. The increases amounted to 9.3 per cent to Ontario's 324 municipal utilities, 9 per cent to about 100 large, direct industrial customers, and 11.2 per cent to 770,000 rural customers served directly by Hydro. The increases were due pri-

REVENUE FROM SALES OF PRIMARY POWER AND ENERGY
million \$



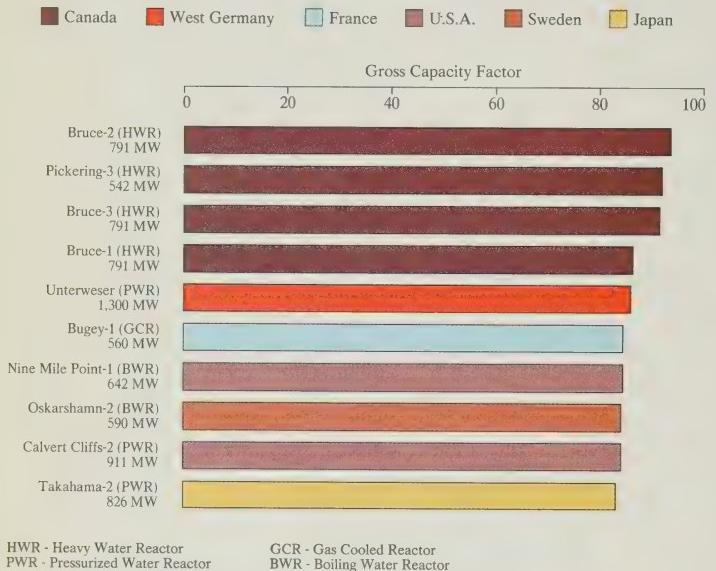
At Hydro's research laboratory in Etobicoke, technologist Werner de Vries conducts an analysis of gases in nuclear fuel.



What would happen to our enjoyment of live entertainment — whether at the Stratford Festival or at ethnic presentation such as this dance at the Japanese Cultural Centre in Don Mills — without the effective contribution of electricity?

Bilingual billing service was extended in the east and in the north

WORLD NUCLEAR REACTOR PERFORMANCE 1980 PERFORMANCE



A 135-kilowatt Mini-Hydel generating station has been installed and commissioned at Wasdell Falls, one of two hydro-electric sites being developed for them in Ontario.

marily to the escalating fuel, maintenance and administration costs, interest and foreign exchange, depreciation, statutory debt retirement obligation and financing of the system expansion program. As a result of municipal utility restructuring, some 25,300 Ontario Hydro customers, together with distribution system plant valued at \$20.8 million, were transferred to 12 municipal utilities in the Regional Municipalities of Niagara, Durham and Halton. This brings the totals since 1978 to year-end 1980 to some 75,700 customers and plant valued at \$60.5 million transferred to restructured utilities.

Late in 1980, bilingual billing service was extended to 11 designated areas in the eastern and northern parts of the province, with new equipment allowing selective mailing of French and English material to customers.

In a report delivered in 1979, the Ontario Energy Board recommended changes in the way costs of electricity are calculated and prices are set, including off-peak hours and seasonal demands. Following an extensive study by Hydro, policy proposals were presented to municipalities, large industrial customers and agricultural groups which were to be included in Ontario Hydro's 1982 rate proposals. Early in 1981, the Ontario Hydro Board of Directors agreed that the affected customers had not received sufficient time to study and respond to the complex proposals and postponed for one year the submission of revised policies in the rate-setting process.

Transmission Systems

After almost 10 years of public hearings, litigation and government inquiries, the 500,000-volt (500-kV) line from Bruce generating station to the Milton transmission station was finally completed through the Town of Halton Hills and placed in-service in June, 1980. A second major transmission line from this nuclear power development is still in the planning stage.

Construction of the 500-kV line from Lennox generating station to Cherrywood transformer station was also com-



Studies were begun on a submarine interconnection across Lake Erie



Construction continues apace as Workmen assemble steel girders at the Bruce B nuclear plant 200 kilometres northwest of Toronto.

pleted and was placed in-service in May, 1980, while the 500-kV line from Claireville transformer station to Cherrywood commenced in 1980 and is scheduled to be completed by the end of 1981. New 500-kV stations at Claireville and Cherrywood were placed in-service in 1980.

During the year, studies were initiated on a direct-current submarine cable interconnection across Lake Erie with General Public Utilities in Pennsylvania. Lake investigations were carried out during the summer months and work began on the preparation of tendering documents for the cable and the converter station. The planned completion date for the project, if approved, is December, 1984. National Energy Board approval, including environmental review, is required.

In addition to the 500-kV lines and stations, a number of 230 and 115-kV lines and stations projects were completed during the year. A total of 105 circuit kilometres (65 circuit miles) of new line was constructed and 150 circuit kilometres (93 circuit miles) of reconductoring existing lines was completed. Four new transformer stations were completed and placed in-service, and additional capacity or switching was added at five major existing stations.

One of the largest forest fires in Northern Ontario's history damaged transmission lines during the summer and left the community of Red Lake without electrical power for five days. Line and forestry crews, supported by helicopters, worked 17-hour shifts replacing 100 wooden poles along the 13-kilometre (eight-mile) line, completing the task before the evacuated residents returned to their homes.

Ontario Hydro's Transmission Effects Demonstration Centre near Barrie attracted more than 1,100 visitors during the past year, including Ontario res-

idents, representatives of U.S. utility and farm groups — as well as many Hydro employees. The centre, designed to demonstrate the effects of 500-kV lines on people, animals and farm equipment working beneath them, developing a mobile demonstration unit scheduled for service this year.

During 1980, more than 80 projects were in progress to select routes for transmission systems, including the upgrading and relocation of old power lines and the construction of new transformer facilities. Regulatory authorities approved 22 of these projects to proceed to property acquisition and construction. The remainder are at various stages of completion.

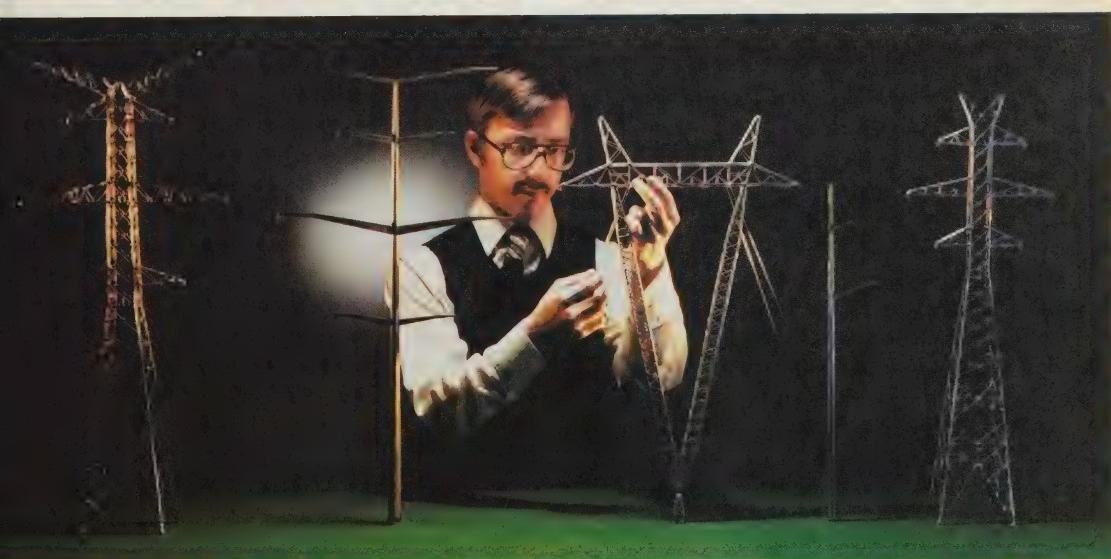
Ontario Hydro tries to recognize adequately the importance of public participation in the planning of project work. As a result, Hydro again relied on the valuable contributions made by the public and all levels of government involved in planning programs to expand and improve the provincial electrical system.

During the year, 16 committees made up of local citizens and municipal government officials assisted Hydro in the project work. The volunteer committee members examined the need for new facilities and the alternatives available and indicated the values they place on several environmental factors.

Ontario Hydro staff also supported two major studies in Eastern and Western Ontario concerning future expansion of existing transmission facilities to meet the growing demand for electric power in these areas, and to improve system reliability and interconnection with United States and Quebec utilities.

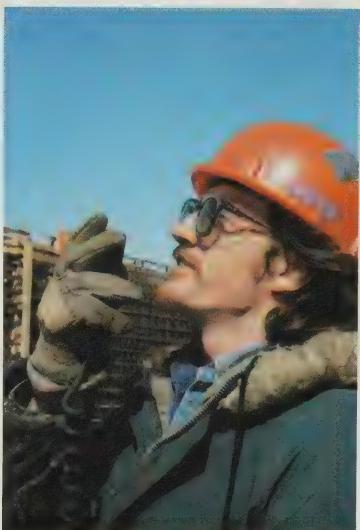
Approximately 30,000 informative handouts were provided to individuals involved in planning studies. Over 100 presentations were also made to local councils and groups involved in transmission and generation projects and

ers from Hydro's research division (right) install underwater probe lights at the Bruce generating station to discourage seals from approaching the plant's cooling water intakes. And below, a fish-eye lens provides a dramatic photo of a tower-lifting machine used in upgrading existing transmission lines.

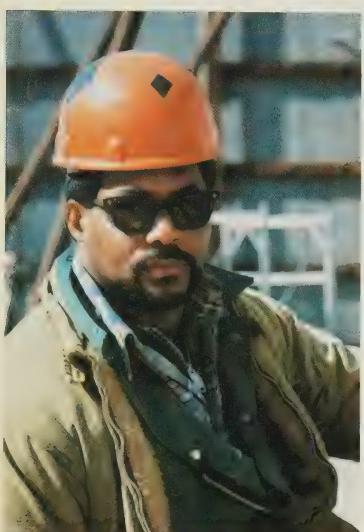


Hydro engineer Bill Chisholm uses these scale models to test the effects of lightning strikes on various types of transmission towers.

Hydro continued its involvement in uranium exploration programs



The faces of workers at Hydro's Bruce nuclear development



information centres established with project study areas.

Fuel Supplies

Ontario Hydro spent \$674 million on fuels for generation during 1980, compared to \$606 million in 1979 — an increase in costs of 11.2 per cent.

Total coal deliveries to generating stations from U.S. mines totalled 8.2 million megagrams (9.1 million tons). The bulk of these deliveries were made under long-term contracts. Movement of Western Canadian bituminous coal by the integrated transportation system amounted to 2.6 million megagrams (2.9 million tons) delivered to East System stations, principally Nanticoke generating station.

Deliveries of residual oil totalled 300,000 barrels for electricity production requirements at Lennox generating station and to support the steam production requirements of the Bruce Heavy Water Plant. Natural gas deliveries of 4.7 billion cubic feet to Hearst generating station were approximately 71 per cent less than in 1979.

Development of facilities for the production of uranium supplies under contract with two Elliot Lake producers continued in 1980.

Initial deliveries under the contract with Denison Mines Limited commenced in 1980 as scheduled. A 1979 lease agreement with Uranium Canada Limited for uranium concentrates was retired in late 1980.

Ontario Hydro continued its involvement in uranium exploration programs carried out by Shell Canada Limited, Amok Limited, Norcen Energy Resources Limited and Canadian Nickel Company Limited. Participation is on a modest scale and is intended to ensure the continued availability of adequate domestic uranium supply alternatives at competitive prices, particularly in light of the active involvement of foreign interests in Canadian uranium exploration.



Health physics technician Doug Kar runs clerical staffer Susan Drane through the whole body counter at Hydro's central safety services division in Pickering. The counter is used to determine whether workers have inhaled or ingested airborne radionuclides at the nuclear plant.

The skill and dedication of Hydro staff members was a key factor



Technician Brian Handy needed snowshoes to reach this acid rain monitor at a remote research station operated jointly by Ontario Hydro and the Ministry of the Environment.

Purchases

The total value of Ontario Hydro awards for fuels, equipment, materials and services during 1980 was \$1.7 billion. This represents an increase of \$100 million from 1979. During 1980, outstanding commitments remained at \$2.6 billion.

Canadian sources, excluding primary fuels, received 79.7 per cent of the total value of 1980 purchases, 90.9 per cent of which was awarded in Ontario. This represents an increase of 2 per cent in the value of Canadian awards from 1979. The equipment and materials expenditures will create 14,000 man-years of employment in Ontario.

In general, the availability of material was adequate during 1980, with no increases reflecting inflationary trends.

Human Resources

The skill and dedication of Hydro's 28,900 staff members was a key factor in the Corporation's ability to meet Ontario energy needs during 1980. Several measures were initiated during the year toward career planning and effort was extended to encourage women to develop careers within Hydro.

Safe working conditions again commanded serious attention, and despite the formation of a task force to analyse accidents and the introduction of system safety techniques — there were three occupational fatalities in 1980. The disabling injury rate was 5.1 per million man-hours and the days lost due to injury were 0.4 per cent of scheduled working days.

A collective agreement with members of the Ontario Hydro Employees' Union resulted in pay increases of about 10 per cent effective April 1, 1980 with provision for further increases in the second year of the agreement. An overall pay increase averaging 10 per cent was awarded to members of The Society of Ontario Management and Professional Staff by arbitrator Judge George Ferguson.

Nuclear Safety

Nuclear safety received considerable attention in 1980. Environmental mea-



Hydro announced programs to cut acid gas emission by 50 per cent

surements of radioactivity in the vicinity of Hydro's nuclear plants were less than one per cent of emission limits approved by the Atomic Energy Control Board. In the nuclear power program there were no public or occupational fatalities or injuries due to radiation exposure.

Improvements were made to the contingency plans to be followed at Hydro's nuclear stations in the event of an emergency. Changes — based on analyses of both the Three Mile Island accident and the Mississauga train derailment — involved evacuation procedures and liaison with police and other authorities.

Air Quality Control

Early in 1981 Ontario Hydro, in conjunction with the Ministry of the Environment, announced it will undertake a \$500 million, 10-year program to cut emissions of acid gases from its coal-fired generating stations by about 50 per cent by 1990. The program, which was agreed to by the Board of Directors and which later became the basis for an Environment ministry regulation, includes the design and installation by 1987 of flue gas scrubbers on two units at either Lambton or Nanticoke — two major coal-fired stations. Scrubbers are capable of removing 90 per cent of the sulphur dioxide from the flue gas stream. In addition, special burners will be installed at Lambton, Nanticoke and Lakeview generating stations to cut emissions of nitrogen oxide.

As part of the program, Hydro will continue purchases of hydro-electric power from Manitoba, increase its buying of low-sulphur coal for blending and continue to purchase washed coal. It is also expected that a lower average load growth of 3.1 per cent through to the year 2000, start up of nuclear units

at Bruce B, Pickering B and Darlington between 1983 and 1991, and a second 500-kilovolt line from Bruce generating station will help lower emissions by decreased dependency on coal-fired generation.



Larry Rankine prepares one of the more than 150,000 radiation dosimetry badges worn each year by Hydro's nuclear plant workers.

Research, Design and Development

The start of engineering and procurement activities for the installation of facilities for a tritium removal system at the Pickering generating station began in August after approval by the Board of Directors. This facility is to be in service in 1985 and will cost approximately \$58 million. It will remove radioactive tritium from the Pickering reactors and concentrate it in a chemical form that can safely be stored. One year's production of tritium at Pickering would just about fill a plastic grocery bag. The facility has been designed to maintain and improve worker safety within the plant, and to develop Hydro's expertise in specialized areas of hydrogen technology, which is vital in the development of future hydrogen energy systems.

As part of Hydro's commitment to produce another 2,000,000 kilowatts of electricity from water power, 17 possible hydro-electric sites have been identified throughout Ontario. Upgrading and renewal of generating equipment at several older hydro-electric stations continued during the year. Installation and commissioning of the prototype Mini-Hydal generating station — a 135-kilowatt unit — were carried out at Wasdale Falls near Orillia. This is a prefabricated, water-powered generator designed to replace diesel units for the supply of power to remote communities. A second unit will go into operation at Sultan, 20 miles from Chapleau, in 1981.

While the bulk of Hydro's research concerned high-technology research in all aspects of electrical generation, studies continued in the use of solar energy, insulation and heat storage furnaces as part of the government's alternative energy program. Work is also continu-



For little Kael Buck — and his furry bedmates — the long and lonely journey down the hallway to his parents' room is made less terrifying by his friend, the night light

ing, in cooperation with the federal government, on the safe storage and disposal of nuclear wastes and on acid gas emission and their control.

Energy Security

Hydro also is involved in a broad range of energy security initiatives aimed not only at conserving energy, but substi-

tuting electricity for oil, and developing alternate or renewable energy sources. Some of these projects are undertaken in cooperation with the Ontario Ministry of Energy, the Canadian Electrical Association and various universities and industries.

They involve the search for energy from wind, wood and refuse burning, hydrogen, methane, biomass, peat and

algae culture. Photovoltaic solar cells are also being tested, as is the feasibility of using hot water and steam from nuclear stations, to heat greenhouses.

Hydro also received in 1980 the first of up to 20 electric vehicles as part of a two-year test program to evaluate the impact on the electric system should they come into widespread use because of rising gasoline prices.

Hydro is financially self-sustaining, derives no revenue from taxes

The Corporation

Ontario Hydro is a special statutory corporation established by the Provincial Legislature in 1906 with broad powers to produce, buy and deliver electric power throughout the province.

The Corporation's primary responsibility is to provide power to municipalities — over which it has certain regulatory functions — which in turn distribute the power to customers in their areas. Hydro also supplies more than

100 direct industrial customers and about 770,000 retail customers in rural areas not served by municipal utilities.

Hydro is part of a massive electric grid that provides interconnections with Manitoba Hydro on the west, Hydro-Québec on the east, and with utilities in New York and Michigan states to the south.

Ontario Hydro is a financially self-sustaining corporation that derives no

revenue from taxes.

The Power Corporation Act Revised Statutes of Ontario 1970, c. 354, amended by which Hydro is governed, sets out that power be provided to the municipal customers at cost. Costs are defined in the act as including charges for power purchases, operation, maintenance, administration, fixed charges and reserve adjustment. Fixed charges include interest, depreciation and the provisions for the retirement of debt over a 40-year period.

The Province of Ontario guarantees the payment of the principal and interest on bonds and notes issued to the public by Ontario Hydro. In the case of public borrowing in the United States the Province borrows on behalf of Hydro by issuing its own debentures and advancing the proceeds to Ontario Hydro upon terms and conditions agreed upon between the Corporation and the Treasurer of Ontario.

Ontario Hydro is administered by a Board of Directors consisting of a chairman, a vice-chairman, a president and not more than 10 other directors. Regular review of strategy, programs and resources is a function of the Executive Office, composed of the chairman, the president, the two executive vice-presidents and the secretary and general counsel.





COMPARATIVE STATISTICS

	1980	1979	1978	1975	1970
Operating					
Dependable peak capacity ('000 kW)	24,457*	24,429*	22,845	18,667	12,670
December primary peak demand ('000 kW)	16,808	16,365	15,722	14,513	11,289
Primary energy made available ('000,000 kW·h) ...	100,174	98,127	95,373	84,222	64,289
Customer					
Primary energy sales ('000,000 kW·h)					
Municipal utilities	64,898**	63,349	61,285	54,523	38,848
Rural retail	12,933**	13,011	12,927	11,049	7,567
Direct industrial	16,432**	15,757	14,775	12,588	13,680
Total	94,263**	92,117	88,987	78,160	60,095
Secondary energy sales ('000,000 kW·h)	10,727**	11,662	10,393	4,924	3,721
Total Ontario customers ('000)					
Residential	2,487**	2,449	2,411	2,239	2,014
Farm	111**	113	115	123	128
Commercial and industrial	322**	316	307	285	246
Total	2,920**	2,878	2,833	2,647	2,388
Average annual kW·h per customer					
Residential	9,930**	9,839	9,797	9,203	7,750
Farm	19,978**	19,225	18,279	15,914	12,305
Commercial and industrial	205,500**	204,113	200,601	188,583	174,339
Average revenue per kW·h (¢)					
Residential	3.64**	3.22	2.98	1.94	1.38
Farm	3.74**	3.42	3.21	2.24	1.76
Commercial and industrial	2.55**	2.35	2.17	1.39	0.94
Financial					
Bonds and other long-term debt issued (\$'000,000) ..	1,462	1,405	1,847	1,601	494
Gross expenditures on fixed assets (\$'000,000)	1,529	1,659	1,694	1,442	511
Revenues (\$'000,000)					
Primary power and energy	2,458	2,222	1,849***	1,028	534
Secondary power and energy	361	346	289	43	20
Assets (\$'000,000)	15,593	14,514	13,163	8,593	4,613
Staff, average for year	28,902	28,385	27,850	25,361	22,584

*Includes mothballed generation; 1980 — 1,704,000 kW and 1979 — 550,000 kW

**Preliminary

***After deducting excess revenues of \$130 million

Financial Review

Ontario Hydro's net income for 1980 was \$216 million as compared with \$268 million in 1979, a decrease of \$52 million. Income for 1980, however, was reduced by an extraordinary charge of \$160 million arising from the cancellation of the Wesleyville construction project when plans to complete an unfuelled generating station at Wesleyville were discontinued. Total 1980 revenues were \$2,819 million. Revenues from sales of primary power and energy in 1980 amounted to \$458 million, an increase of 11% over the previous year. This increase of \$237 million was primarily due to the 8.3% increase in bulk power rates and, to a lesser extent, increased volume of sales. In 1980 the total primary delivered load increased by 1.8% and delivered energy by 2.1% over 1979. Revenues from sales of secondary power and energy amounted to \$361 million in 1980, \$14 million or 4% higher than in 1979. This increase in secondary revenues resulted mainly from increased prices for sales of electricity to United States utilities.

Costs, excluding financing charges and the extraordinary charge, totalled \$1,768 million in 1980 compared to \$1,646 million in 1979, an increase of 7%. Operation, maintenance and administration costs were \$640 million in 1980, an increase of \$38 million or 6% over 1979. This increase resulted mainly from the escalation of labour and material costs, and increased costs of operating and maintaining facilities in service. The cost of fuel used for electric generation increased from \$68 million to \$674 million in 1980 reflecting an 8% increase in the volume of electricity generated by thermal stations and a 11% increase in the average unit cost of fuels burned. Payments required under the nuclear payback agreement increased by \$4 million in 1980. Depreciation costs rose \$21 million in 1980 to \$306 million, mainly as the result of additional information and transmission facilities being placed in service.

Interest and foreign exchange costs charged to operations totalled \$675 million in 1980, \$20 million or 3% higher than 1979. Interest costs increased by \$72 million or 12% over 1979, reflecting financing costs associated with new fixed assets in service and new borrowings at higher interest rates partially offset by gains on the retirement of bonds. However, foreign exchange costs decreased \$52 million from 1979 mainly as a result of the decreased level of foreign debt retired during 1980.

The amount of net income appropriated for debt retirement, required by The Power Corporation Act, increased by \$12 million in 1980 to \$138 million. The remaining \$78 million balance of 1980 net income was appropriated for stabilization reserves and contingencies compared to \$142 million in 1979. The overall financial position of the Corporation, as reflected in the debt-equity and interest coverage ratios improved during 1980 as shown below:

Financial Ratios	1980	1979
Debt-Equity Ratio	.846	.848
Interest Coverage	1.32	1.26

In 1980 the major application of funds was for the construction of new plant and facilities. Net additions to fixed assets were \$1,470 million, comprised of \$968 million for generation facilities, \$219 million for transmission and distribution facilities, \$76 million for heavy water facilities, \$116 million for the production of heavy water and \$91 million for administration and service assets. Net additions were \$105 million lower than those in 1979, mainly as the result of the reduced level of expenditures on generation and heavy water production facilities. The expenditures during 1980 and 1979 on major generation facilities under construction were:

Major Generation Facilities Under Construction	1980 Expenditures \$ million	1979 Expenditures \$ million
Nuclear Generating Stations		
Bruce "B"	435	386
Pickering "B"	291	326
Darlington	69	56
Fossil Generating Stations		
Thunder Bay	89	124
Atikokan	39	25

Other 1980 applications of funds were increases in advance payments for fuel supplies of \$147 million, increases in accounts receivable and other assets of \$78 million and increases in fuel, materials and supplies of \$48 million. In addition, decreases in accounts payable and accrued interest amounted to \$120 million in 1980.

Funds provided from operations in 1980 amounted to \$682 million while net financing provided \$1,180 million. Compared to 1979, these amounts increased by \$130 million and decreased by \$250 million respectively.

Proceeds from the issue of long-term bonds, notes and other long-term debt during 1980 totalled \$1,462 million. Canadian bond issues of \$950 million were floated publicly, and a further \$500 million was issued to the Province of Ontario with respect to Canada Pension Plan funds advanced to Ontario Hydro. The average coupon interest rate of bond issues in 1980 was 13.0%, as compared to an average rate of 9.9% in 1979. There were no foreign long-term debt issues during 1980. Additional funds were provided by reducing the level of cash and investments by \$195 million and increasing the short-term notes payable by \$124 million. Leases of capital equipment valued at \$12 million provided other long-term financing. Retirement of long-term debt during the year amounted to \$602 million.

Auditors' Report

We have examined the statement of financial position of Ontario Hydro as at December 31, 1980 and the statements of operations, equities accumulated through debt retirement appropriations, reserve for stabilization of rates and contingencies and changes in financial position for the year then ended. Our examination was made in accordance with generally accepted auditing standards, and accordingly included such tests and other procedures as we considered necessary in the circumstances.

In our opinion, these financial statements present fairly the financial position of Ontario Hydro as at December 31, 1980 and the results of its operations and the changes in its financial position for the year then ended in accordance with generally accepted accounting principles applied on a basis consistent with that of the preceding year.

Toronto, Canada
March 30, 1981

CLARKSON GORDON
Chartered Accountants

Summary of Significant Accounting Policies

The accompanying financial statements have been prepared by management in accordance with generally accepted accounting principles in Canada, applied on a consistent basis. In management's opinion, the financial statements have been properly prepared within reasonable limits of materiality and in the light of information available up to March 30, 1981. To assist the reader in understanding the financial statements, the corporation's significant accounting policies are summarized below:

Fixed assets

Fixed assets are capitalized at cost which is comprised of material, labour and engineering costs, plus overheads, depreciation on service equipment and interest allocable to capital construction activities. In the case of generation facilities, cost also includes the net cost of commissioning, and for nuclear generation, the cost of heavy water. The net cost of commissioning is the cost of start-up less the value attributed to energy produced by units during their commissioning period. The cost of heavy water is the direct cost of production and allocable overheads, plus interest and depreciation on heavy water production facilities. Leases which transfer the benefits and risks of ownership of assets to Ontario Hydro are capitalized.

Interest is capitalized on construction in progress at rates which approximate the average cost of long-term funds borrowed in the years in which expenditures have been made for fixed assets under construction. The effective annual rates were 10.2% in 1980 and 10.0% in 1979.

If it is decided to significantly extend the construction period of a project, interest is not capitalized on construction during the period of extension. If a project is deferred after construction has started, mothballing costs associated with the deferral are charged to operations. Interest is not capitalized on deferred projects during the period of their deferral. If a project is cancelled, all costs, including the costs of cancellation, are written off to operations.

Depreciation

Fixed assets in service, except land, are depreciated on a straight-line estimated service life basis. Depreciation rates for the various classes of assets are based on their estimated service lives, which are subject to periodic review. Any changes in service life estimates are implemented on a remaining service life basis. The estimated service lives of assets in the major classes are:

Generation	— hydraulic	— 50 to 100 years
	— fossil and nuclear	— 30 years

Heavy water	—	over the period ending in the year 2030
-------------	---	---

Transmission and distribution	—	25 to 55 years
-------------------------------	---	----------------

Administration and service	—	5 to 60 years
----------------------------	---	---------------

Heavy water production facilities	—	20 years
-----------------------------------	---	----------

In accordance with the group depreciation practices of the utility industry, for normal retirements the cost of fixed

assets retired is charged to accumulated depreciation with no gain or loss being reflected in operations. However, gains and losses on sales of fixed assets, losses on premature retirements, and the costs of removal less salvage proceeds on all retirements, are charged to operations in the year incurred as adjustments to depreciation expense.

Fixed assets removed from service and mothballed for future use are amortized so that any estimated loss in value is charged to operations on a straight-line basis over their expected non-operating period.

Deferred projects are amortized so that any estimated loss in value is charged to operations on a straight-line basis over their expected deferral period.

Advance payments for fuel supplies

As part of its program to ensure the adequate supply of fuels for its generating stations, Ontario Hydro has entered into long-term fuel supply contracts. Where these contracts require Ontario Hydro to make payments to suppliers in advance of product delivery for pre-production costs, these payments and associated costs, including interest, are carried in the accounts as advance payments for fuel supplies. The advance payments are amortized to fuel inventory as the fuels are delivered.

Fuel for electric generation

The cost of fuel for electric generation is comprised of fuel purchases, transportation and handling costs, and the amortization of advance payments for fuel supplies. Transportation costs include interest and depreciation on railway equipment owned by Ontario Hydro. Fuel used for electric generation is charged to operations on the average cost basis.

Nuclear agreement — Pickering units 1 and 2

Ontario Hydro, Atomic Energy of Canada Limited and the Province of Ontario are parties to a joint undertaking for the construction and operation of units 1 and 2 of Pickering Nuclear Generating Station, with ownership of these units being vested in Ontario Hydro. Contributions to the capital cost by Atomic Energy of Canada Limited and the Province of Ontario amounted to \$258 million and these have been deducted in arriving at the value of fixed assets in service in respect of Pickering units 1 and 2. Ontario Hydro is required to make monthly payments until the year 2001 to each of the parties in proportion to their capital contributions. These payments, termed "payback", represent in a broad sense the net operational advantage of having the power generated by Pickering units 1 and 2 as compared with coal-fired units similar to Lambton units 1 and 2.

Commissioning energy

Revenues from the sale of power and energy include revenues from energy produced by generating units during the commissioning period. A charge is included in the cost of operations for the value attributed to the energy produced during the commissioning period. This charge is equivalent to the operating and fuel costs of

producing the same quantity of energy at generating units displaced because of the commissioning activity.

Appropriations from net income

Under the provisions of The Power Corporation Act, the price payable by customers for power is the cost of supplying the power. Such cost is defined in the Act to include the cost of operating and maintaining the system, depreciation, interest, and the amounts appropriated for debt retirement and stabilization of rates and contingencies.

The debt retirement appropriation is the amount required under the Act to accumulate in 40 years a sum equal to the debt incurred for the cost of the fixed assets in service. The appropriation for, or withdrawal from, the stabilization of rates and contingencies reserve is an amount established to maintain a sound financial position and to stabilize the effect of cost fluctuations.

Foreign currency translation

Long-term debt payable in foreign currencies is translated to Canadian currency at rates of exchange at the time of issue. Current monetary assets and liabilities,

including long-term debt payable within one year, are adjusted to Canadian currency at year-end rates of exchange. The resulting translation gains or losses, together with realized exchange gains or losses, are credited or charged to operations.

Pension plan

The pension plan is a contributory, defined benefit plan covering all regular employees of Ontario Hydro. The pension costs for each period, as actuarially determined, include current service costs and amounts required to amortize any surpluses or unfunded liabilities. Pension plan surpluses or unfunded liabilities are amortized over a fifteen year period.

Research and development

Research and development costs are charged to operations in the year incurred, except for those related directly to the design or construction of a specific capital facility. Prior to 1979, certain development costs and expenditures related to the overall planning of the power system had been capitalized and are being amortized over a 10 year period.

**Statement of Operations
for the year ended December 31, 1980**

	1980	1979
	\$'000	\$'000
Revenues		
Primary power and energy		
Municipal utilities	1,603,072	1,441,557
Rural retail customers	513,616	474,795
Direct industrial customers	341,785	305,210
	2,458,473	2,221,562
Secondary power and energy (note 2)	360,742	346,558
	2,819,215	2,568,120
Costs		
Operation, maintenance and administration	639,572	601,422
Fuel used for electric generation (note 3)	673,856	605,839
Power purchased	99,490	98,456
Nuclear agreement — payback	49,038	53,195
Commissioning energy	229	2,776
Depreciation (note 4)	305,967	284,610
	1,768,152	1,646,298
Income before financing charges and extraordinary item	1,051,063	921,822
Interest (note 5)	655,399	583,332
Foreign exchange (note 6)	19,238	70,875
	674,637	654,207
Income before extraordinary item	376,426	267,615
Extraordinary item (note 1)	160,000	—
Net income	216,426	267,615
Appropriation for:		
Debt retirement as required by		
The Power Corporation Act	137,743	125,932
Stabilization of rates and contingencies	78,683	141,683
	216,426	267,615

See accompanying summary of significant accounting policies and notes to financial statements

**Statement of Financial Position
as at December 31, 1980**

Assets	1980 \$'000	1980 \$'000
Fixed assets		
Fixed assets in service (note 7)	10,887,352	10,441,9
Less accumulated depreciation	<u>2,443,317</u>	<u>2,147,7</u>
	8,444,035	8,294,3
Construction in progress (note 7)	4,801,293	3,674,3
Deferred construction projects (note 8)	<u>384,849</u>	<u>659,2</u>
	<u>13,630,177</u>	<u>12,628,8</u>
Current assets		
Cash and short-term investments (note 9)	239,118	381,1
Accounts receivable	346,840	292,6
Fuel for electric generation (note 10)	618,262	579,2
Materials and supplies, at cost	<u>144,179</u>	<u>132,8</u>
	<u>1,348,399</u>	<u>1,385,0</u>
Other assets		
Advance payments for fuel supplies (note 11)	414,105	267,3
Unamortized debt discount and expense	121,829	117,3
Long-term accounts receivable and other assets	78,837	60,0
Long-term investments	<u>—</u>	<u>53,4</u>
	<u>614,771</u>	<u>499,0</u>
	<u>15,593,347</u>	<u>14,513,7</u>

See accompanying summary of significant accounting policies and notes to financial statements.

	1980	1979
	\$'000	\$'000
Liabilities		
Long-term debt		
Bonds and notes payable (note 12)	12,103,349	11,206,395
Less long-term debt (note 13)	<u>272,355</u>	<u>309,330</u>
	12,375,704	11,515,725
Payable within one year	<u>370,646</u>	<u>381,540</u>
	12,005,058	11,134,185
Current liabilities		
Accrued amounts payable and accrued charges	470,032	618,455
Short-term notes payable	144,525	20,070
Accrued interest	318,809	289,941
Short-term debt payable within one year	<u>370,646</u>	<u>381,540</u>
	1,304,012	1,310,006
Contingencies (notes 3, 7 and 8)		
Contingency		
Debt accumulations through debt retirement appropriations	1,651,937	1,516,026
Reserve for stabilization of rates and contingencies	505,645	426,817
Contributions from the Province of Ontario as assistance		
Rural construction	<u>126,695</u>	<u>126,695</u>
	2,284,277	2,069,538
	<u>15,593,347</u>	<u>14,513,729</u>

on behalf of the Board

M. Nastich

Chairman

President

Toronto, Canada
March 30, 1981

**Statement of Equities Accumulated through
Debt Retirement Appropriations
for the year ended December 31, 1980**

	Municipal Utilities	Power District (Rural Retail and Direct Industrial Customers)	Totals	
			\$'000	\$'000
Balances at beginning of year	1,058,611	457,415	1,516,026	1,391,181
Debt retirement appropriation	93,025	44,718	137,743	125,932
Transfers and refunds on annexations				
by municipal utilities	6,820	(8,652)	(1,832)	(1,087)
Balances at end of year	<u>1,158,456</u>	<u>493,481</u>	<u>1,651,937</u>	<u>1,516,026</u>

**Statement of Reserve for Stabilization
of Rates and Contingencies
for the year ended December 31, 1980**

	Held for the benefit of all customers	Held for the benefit of (or recoverable from) certain groups of customers			Totals	
		Municipal Utilities	Rural Retail Customers	Direct Industrial Customers	1980	1979
	\$'000	\$'000	\$'000	\$'000	\$'000	\$'000
Balances at beginning of year	450,190	1,144	(24,150)	(367)	426,817	284,917
Appropriation	54,474	110	22,599	1,500	78,683	141,683
Transfers and recoveries on annexations by municipal utilities	(253)	—	508	—	255	326
Payment to Ontario Municipal Electric Association (note 14)	—	(110)	—	—	(110)	(109)
Balances at end of year	<u>504,411</u>	<u>1,144</u>	<u>(1,043)</u>	<u>1,133</u>	<u>505,645</u>	<u>426,817</u>

See accompanying summary of significant
accounting policies and notes to financial statements.

Statement of Changes in Financial Position for the year ended December 31, 1980

	1980 \$'000	1979 \$'000 (note 18)
Source of Funds		
Operations		
Income before extraordinary item	376,426	267,615
Depreciation, a charge not requiring funds in the current year	<u>305,967</u>	<u>284,610</u>
	<u>682,393</u>	<u>552,225</u>
Financing		
Long-term debt		
Bonds and notes payable and other long-term debt issued	1,462,089	1,404,844
Less retirements	<u>602,110</u>	<u>287,794</u>
	<u>859,979</u>	<u>1,117,050</u>
Short-term notes payable — increase (decrease)	124,455	(5,345)
Cash and investments — decrease	<u>195,410</u>	<u>317,911</u>
	<u>1,179,844</u>	<u>1,429,616</u>
	<u>1,862,237</u>	<u>1,981,841</u>
Application of Funds		
Net additions to fixed assets (note 15)	1,469,550	1,574,716
Increase in advance payments for fuel supplies	146,722	126,680
Decrease in accounts payable and accrued interest	119,555	27,227
Increase in accounts receivable and other assets	78,331	65,239
Increase in fuel, materials and supplies	<u>48,079</u>	<u>187,979</u>
	<u>1,862,237</u>	<u>1,981,841</u>

See accompanying summary of significant accounting policies and notes to financial statements.

Notes to Financial Statements

1. Extraordinary item

As a result of the 1980 and 1981 forecasts projecting reduced rates of growth in future electrical demand, and the fact that recent studies indicate it is cost effective to install nuclear and hydraulic generation before adding more fossil-fueled stations, the plan to complete an oil-fueled generating station at Wesleyville was cancelled effective December 31, 1980. An extraordinary charge of \$160 million was made against income for 1980 to write off construction project costs and to provide for the estimated costs of cancellation. These estimates reflect the best current judgment of management but may be subject to adjustment when the final amounts are known. (See note 8.)

2. Secondary power and energy

Secondary power and energy is comprised mainly of revenues of \$359 million in 1980 (1979 — \$345 million) from sales of electricity to United States utilities.

3. Fuel used for electric generation

Ontario Hydro has contracted with Petrosar Limited for the supply of 20,000 barrels of residual fuel oil per day through to April 1992. Because of reduced requirements, deliveries in 1979 and 1980 were less than the contract quantity. As compensation, Ontario Hydro paid \$11 million to Petrosar Limited in 1979, and is negotiating with them concerning the acceptance of lower than contracted deliveries in 1980. Pending the outcome of these negotiations, no estimate of the cost is possible and therefore no provision was made in 1980.

4. Depreciation

	1980	1
	\$'000	\$
Depreciation of fixed assets in service	334,901	326
Amortization of deferred construction projects	13,954	8
Costs of removal less salvage proceeds on retirements	2,573	3
	<u>351,428</u>	<u>338</u>
Less:		
Depreciation charged to — heavy water production	21,605	22
— construction in progress	17,636	16
— fuel for electric generation	2,248	2
Net gains on sales of fixed assets	3,972	12
	<u>45,461</u>	<u>53</u>
	<u>305,967</u>	<u>284</u>

Depreciation of fixed assets in service includes \$3.7 million (1979 — \$0.4 million) for the amortization of non-operating generating units which have been mothballed for future use. (See note 7.)

5. Interest

	1980	1
	\$'000	\$
Interest on bonds, notes, and other debt	1,165,921	1,029
Less:		
Interest charged to — construction in progress	328,985	282
— heavy water production	34,343	35
— advance payments for fuel supplies	29,323	18
— fuel for electric generation	8,603	4
Interest earned on short-term and long-term investments	72,664	89
Net gain on redemption of bonds and sale of investments	36,604	15
	<u>510,522</u>	<u>446</u>
	<u>655,399</u>	<u>583</u>

6. Foreign exchange

	1980	1
	\$'000	\$
Exchange loss on redemption and translation of foreign long-term debt	23,470	30
Exchange loss on refinancing of foreign long-term debt	—	3
Net exchange (gain) loss on other foreign transactions	(4,232)	1
	<u>19,238</u>	<u>7</u>

ixed assets

	1980			1979		
	Assets in Service	Accumulated Depreciation	Construction in Progress	Assets in Service	Accumulated Depreciation	Construction in Progress
eration — hydraulic . . .	1,733,004	390,861	11,714	1,729,400	360,153	8,976
— fossil	2,254,239	635,175	549,632	2,231,864	556,224	377,204
— nuclear	1,896,320	245,889	2,781,114	1,878,802	183,467	1,930,619
ly water	589,484	66,533	249,134	589,484	56,227	110,632
mission and						
tribution	3,396,803	783,017	326,307	3,063,815	722,375	456,491
ministration and service	547,038	200,329	24,752	502,776	170,882	8,098
ly water production						
ilities	470,464	121,513	858,640	445,843	97,998	782,909
	<u>10,887,352</u>	<u>2,443,317</u>	<u>4,801,293</u>	<u>10,441,984</u>	<u>2,147,326</u>	<u>3,674,929</u>

result of recent forecasts projecting reduced rates of growth in future electrical demand, certain fossil-fueled rating units were mothballed for future use; during 1979, three units at the R. L. Hearn Generating Station, during 1980, a further two units at R. L. Hearn and two units at the Lennox Generating Station were mothballed. capital cost and accumulated depreciation of these non-operating units, amounting to \$268 million and \$76 million, respectively (1979 — \$33 million and \$22 million, respectively), are included in fossil generation assets service. At this time it is uncertain when these units will resume operation.

Mothballing costs associated with these units were charged to operations as incurred. The costs of mothballing units were not significant.

Construction in progress at December 31, 1980 is comprised of:

	Planned In-Service Dates	Generating Capacity to be Installed	Costs Incurred to December 31, 1980	Estimated Future Costs to Complete (Including Escalation)
			\$ millions	\$ millions
ear generating stations (including heavy water)		MW		
Pickering "B"	1983-84	2,160	1,685	1,430
Bruce "B"	1983-87	3,200	1,053	3,500
Darlington	1988-91	3,600	188	6,500
Generating stations				
Thunder Bay	1981-82	300	385	50
Atikokan	1984-88	400	88	850
Heavy Water Plant "B"	1981	—	859	130
her construction in progress	—	—	543	—
			<u>4,801</u>	

above estimates are the most recent forecasts as of March 30, 1981. Because of long construction lead on these projects, the assumptions underlying these forecasts are subject to change which may affect the in-service dates and estimated future costs to complete.

Preferred construction projects

	1980			1979		
	Capital Cost	Accumulated Amortization	Unamortized Cost	Capital Cost	Accumulated Amortization	Unamortized Cost
Heavy Water Plant "D"	395,840	13,540	382,300	419,013	3,850	415,163
Wesleyville Generating Station	—	—	—	244,520	3,733	240,787
Projects	5,724	3,175	2,549	5,941	2,636	3,305
	<u>401,564</u>	<u>16,715</u>	<u>384,849</u>	<u>669,474</u>	<u>10,219</u>	<u>659,255</u>

result of forecasts projecting reduced rates of growth in future electrical demand, the Board of Directors the following revisions to the capital construction program:

Heavy Water Plant "D"

In 1978, it was decided to stop construction on the second half of the plant and store the components. In 1979 decided to complete construction and then mothball the first half of the plant. It is uncertain at this time when ant will be used.

Wesleyville Generating Station

In 1978, units 1 and 2 were cancelled and associated costs of \$20.5 million were written off as an extraordinary income. In 1979, it was decided to stop construction on units 3 and 4 and store the components. Plan to complete the Wesleyville oil-fueled generating station was cancelled effective December 31, 1980. (note 1.)

Mothballing costs associated with the above deferrals amounting to \$15 million and \$20 million were charged to operations in 1978 and 1979, respectively. There were no mothballing costs incurred in 1980.

9. Cash and short-term investments

	1980 \$'000	1980 \$'000
Cash and interest bearing deposits with banks and trust companies	67,012	276,
Corporate bonds and notes	53,580	85,
Government and government-guaranteed securities	<u>118,526</u>	<u>19,</u>
	<u>239,118</u>	<u>381,</u>

Corporate bonds and notes were recorded at cost which approximates market value. Government and government-guaranteed securities were recorded at the lower of cost or market value; market value as at December 1980 was \$120 million (1979 — \$19 million).

10. Fuel for electric generation

	1980 \$'000	1980 \$'000
Inventories — coal	484,511	460,
— uranium	100,608	87,
— oil	<u>33,143</u>	<u>31,</u>
	<u>618,262</u>	<u>579,</u>

11. Advance payments for fuel supplies

	1980 \$'000	1980 \$'000
Coal	99,799	89,
Uranium	<u>314,306</u>	<u>177,</u>
	<u>414,105</u>	<u>267,</u>

Based on present commitments, additional advance payments for fuel supplies, excluding interest, will approximately \$322 million over the next five years, including approximately \$142 million in 1981.

12. Bonds and notes payable

Bonds and notes payable, expressed in Canadian dollars, are summarized by years of maturity and by the currency in which they are payable in the following table:

Years of maturity	1980			1979	
	Principal Outstanding \$'000	Weighted Average Coupon Rate	Principal Outstanding \$'000	Weighted Average Coupon	
	Canadian	Foreign	Total	Total	
1980	—	—	—	364,917	
1981	237,609	116,931	354,540	328,474	
1982	206,434	179,722	386,156	433,941	
1983	171,679	203,447	375,126	375,199	
1984	99,130	115,634	214,764	214,763	
1985	566,082	294,719	860,801	—	
1 — 5 years	1,280,934	910,453	2,191,387	8.9%	1,717,294
6 — 10 years	252,877	517,383	770,260	7.5	1,016,246
11 — 15 years	382,643	176,062	558,705	8.5	540,668
16 — 20 years	1,738,349	624,915	2,363,264	9.3	1,616,009
21 — 25 years	1,704,093	1,101,671	2,805,764	9.3	2,390,550
26 — 30 years	1,464,357	1,949,612	3,413,969	10.0	3,925,628
	<u>6,823,253</u>	<u>5,280,096</u>	<u>12,103,349</u>		<u>11,206,395</u>
Currency in which payable					
Canadian dollars	6,823,253			5,557,206	
United States dollars	5,132,709			5,338,998	
West German Deutsche marks	90,663			95,911	
Swiss francs	<u>56,724</u>			<u>214,280</u>	
	<u>12,103,349</u>			<u>11,206,395</u>	

The bonds and notes payable in United States dollars include \$3,949 million (1979 — \$4,072 million) of Ontario Hydro bonds held by the Province of Ontario and having terms identical with Province of Ontario issues sold in the United States on behalf of Ontario Hydro. Except for these bonds and \$500 million of bonds issued to the Province of Ontario with respect to Canada Pension Plan funds advanced to Ontario Hydro, all bonds and notes payable are guaranteed as to principal and interest by the Province of Ontario.

The long-term bonds and notes payable in foreign currencies are translated into Canadian currency at rates of exchange at time of issue. If translated at year-end rates of exchange, the total amount of these liabilities would be increased by \$794 million at December 31, 1980 (1979 — \$730 million).

	1980 \$'000	1979 \$'000
Other long-term debt		
Balance due to Atomic Energy of Canada Limited for the purchase of Bruce Heavy Water Plant "A". Under the purchase agreement, Ontario Hydro pays equal monthly instalments of blended principal and interest to December 28, 1992, with interest at the rate of 7.795%	197,549	207,223
Capitalized lease obligation for the head office building at 700 University Avenue, Toronto. The lease obligation is for the 30-year period ending September 30, 2005, payable in United States dollars at an effective interest rate of 8%	42,455	42,960
Capitalized lease obligations for transport and service equipment. Under these agreements, monthly instalments of blended principal and interest will be paid to 1988, at effective interest rates ranging from 6.8% to 18.25%	32,351	21,344
Liability for borrowed uranium	—	37,803
	<u>272,355</u>	<u>309,330</u>

Payments required on the above debt, exclusive of interest, will total \$91 million over the next five years. The amount payable within one year is \$16 million (1979 — \$17 million).

Payment to Ontario Municipal Electric Association

The amount of this payment is equivalent to interest on the balance held for the benefit of Municipalities in the Reserve Stabilization of Rates and Contingencies.

Net additions to fixed assets

Additions to fixed assets are capital construction expenditures less the proceeds on sales of fixed assets. In 1980, additions to fixed assets reflect proceeds on sales amounting to \$76 million (1979 — \$114 million). For 1981, net additions to fixed assets are forecast at \$2,260 million.

Pension plan

The most recent actuarial valuation of Ontario Hydro's pension plan as at December 31, 1979 reported a surplus of approximately \$81 million (December 31, 1978 — an unfunded liability of approximately \$23 million). The actual rate of return on pension plan investments for 1979 exceeded the rate assumed in the 1978 actuarial valuation resulting in the elimination of the unfunded liability as at December 31, 1978.

Significant actuarial assumptions used in the 1979 valuation (1978 valuation) were:

- rate used to discount future investment income and benefits 7% (1978 — 7%)
- salary escalation rate 6.75% (1978 — 6.75%)
- average retirement age 62.2 for males, 61.9 for females (1978 — 62.4 and 61.0, respectively)
- common stocks valuation 5 year average (1978 — 5 year average)

Pension plan costs for 1980 were \$43 million (1979 — \$48 million), after a reduction of \$7 million for amortization of pension plan net surpluses (1979 — after including \$4 million for the amortization of pension plan unfunded liabilities).

Research and development

In 1980, approximately \$41 million of research and development costs were charged to operations and \$4 million were capitalized (1979 — \$39 million and \$4 million, respectively).

Comparative figures

In the 1979 comparative figures have been reclassified to conform with the 1980 financial statement presentation.

Pension and Insurance Fund Statement of Assets as at December 31, 1980

	1980 \$'000	1979 \$'000
Fixed income securities		
Government and government-guaranteed bonds	299,974	286,541
Corporate bonds	173,055	143,125
First mortgages	375,340	340,026
Total fixed income securities	<u>848,369</u>	<u>769,692</u>
Equities – corporate shares	343,282	269,531
Cash and short-term investments	72,283	87,957
Total investments	<u>1,263,934</u>	<u>1,127,180</u>
Accrued interest and dividends	17,224	15,915
Receivable from Ontario Hydro	2,965	748
	<u>1,284,123</u>	<u>1,143,843</u>

Notes

1. Accounting Policies

In the above statement of assets which is prepared on the accrual basis of accounting, bonds are included at amortized cost, first mortgages at balance of principal outstanding and shares at cost. Total bonds and shares at December 31, 1980 with a book value of \$816 million had a market value of \$928 million (1979 – \$699 million and \$732 million, respectively).

2. Actuarial Valuation

The most recent actuarial valuation of Ontario Hydro's pension plan at December 31, 1979 reported a surplus of approximately \$81 million (December 31, 1978 – an unfunded liability of approximately \$23 million). Pension plan surpluses or unfunded liabilities are amortized over a fifteen year period.

Auditors' Report

(Pension and Insurance Fund)

We have examined the statement of assets of The Pension and Insurance Fund of Ontario Hydro as at December 31, 1980. Our examination was made in accordance with generally accepted auditing standards, and accordingly included such tests and other procedures as we considered necessary in the circumstances.

In our opinion, the accompanying statement presents fairly the assets of the fund as at December 31, 1980 in accordance with the accounting policies described in note 1 applied on a basis consistent with the preceding year.

Toronto, Canada
March 30, 1981

CLARKSON GORDON
Chartered Accountants

ISSN 0382-2826

Printed in Can

CA2PN
EP
- A55

Ontario Hydro Annual Report/1981



FINANCIAL HIGHLIGHTS

	<u>1981</u>	<u>1980</u>
	(in thousands of dollars)	
Revenues	3,161,508	2,819,215
Income Before Extraordinary Item	406,818	376,426
Total Assets	17,829,621	15,593,347
Net Additions to Fixed Assets	2,144,210	1,469,550

ONTARIO HYDRO

Head Office, 700 University Avenue, Toronto M5G 1X6

Ontario Hydro is a special statutory corporation providing electricity for municipal utilities, rural customers and a group of large direct industrial customers. It is

financially self-sustaining and provides power at cost bonds, notes and debentures issued to the public guaranteed by the Province of Ontario.

POR T OF THE
BOARD OF DIRECTORS
ONTARIO HYDRO
FOR THE YEAR 1981

Honourable Robert Welch,
Minister of Energy

the Board of Directors,
mit to you this report of the
nancial position and relevant
ario Hydro activities for the
r 1981. We would like to
nk you and the staff of the
istry of Energy for the co-
peration and understanding
ended during the year.

behalf of the Board



Hugh L. Macaulay
1982



An interview with Hugh Macaulay

Hydro appears to be a major instrument in the government's determination to stimulate the provincial economy. Can you comment on this?

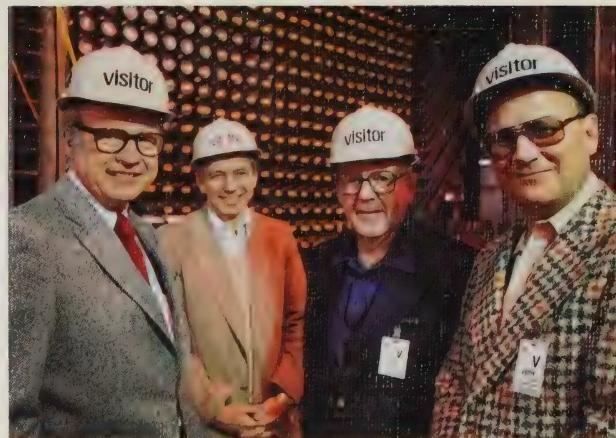
The Ontario government has called Hydro's power system a cornerstone of the provincial economy, and said that the continued vitality and development of that system is essential to sustaining Ontario's economic growth. That kind of thinking, coupled with a new awareness of the value of indigenous energy resources and the need to end our dependence on fossil fuels, has resulted in new approaches to planning at Ontario Hydro. Instead of working merely to meet anticipated demand, we are now looking at a wider role for Ontario Hydro, considering the effects our large construction projects, our exports, our rates, and in fact all our activities can have on the social, environmental and economic life of the province. That's one reason why we're going ahead with new hydro-electric projects and completing the nuclear ones we've started while we're in a period of surplus generation. But it's not the only reason.

Ontario's demand for electricity is growing annually at an average of three per cent, and it takes 10 to 15 years to bring new generating plants on stream. We're looking a long way down the road. A lot of things can change. We've got to be ready for anything that comes along.

The challenge that faces us is to play an increasing role in the life of the province while continuing to provide electricity to our customers in an efficient, reliable, and affordable way.

For the first time in several years, Hydro's proposed rate increase for 1983 is higher than the predicted inflation rate. Does this foretell even larger rate hikes in future years?

In real terms, the price of electricity to consumers in Ontario has declined since 1978. That is, our annual rate increases in the period 1978 to 1981 have averaged one per cent below the forecast rate of inflation. And the 1982 rate was below the forecast rate for this year. The rate proposal submitted to the Ontario Energy Board for 1983 averages 13.2 per cent for municipal utilities and 14.8 per cent for select industrial customers. With 1983 inflation forecast at 12.5 per cent, we're going to be slightly over inflation. But we are facing some extraordinary expenses over the next few years above and beyond



Ontario Hydro's senior management team (from left): Chairman Hugh Macaulay, President Milan Nastich and Executive Vice-Presidents Pat Campbell and Arvo Niitenberg on a visit to the Bruce Nuclear Power Development near Kincardine.

the normal inflationary pressures on our fuel and operation costs. Hydro will be placing in service large, high capital cost generating stations as well as major new transmission facilities. In addition, we are experiencing record-high interest rates and a weak Canadian dollar. Both add to the cost of the money we borrow in Canada and foreign countries to pay for these new projects. Part of Hydro's capital expenditures over the next few years are necessary to meet the Ontario government's objective of an economic system for the 1980s based increasingly on electrical power and nuclear technology. Our currently committed generation expansion program will cost an estimated \$21 billion. About 90 per cent of this will be spent on construction of the Darlington nuclear station and completion of the Pickering B and Bruce B nuclear facilities. Nuclear stations have significantly lower fuelling costs. For example, in 1981 the cost of nuclear fuel to generate one kilowatt-hour of electricity was only one-tenth of the cost of the coal needed to make the same amount of energy. The introduction of this additional nuclear-generated power into our system will markedly reduce the need for more costly coal purchases and, as an added bonus, will reduce the acid gas emissions from our coal-fired stations. All this will mean, we believe, more stable rates in the mid-1980s, when we more fully realize the nuclear advantage.

Q. Economic issues aside, what do you consider the biggest problem facing Ontario Hydro?

A. I guess it would be obtaining approval for transmission lines or getting the power to where our customers are. Especially in the southwestern and the eastern sections of Ontario. In both areas our transmission systems are operating near capacity. In the east we must improve the system to meet the



growing demands of the Ottawa area and increase the capacity of interconnections with Hydro-Quebec. In the west similar growth demands have to be met. There is also a critical need to get the cheaper nuclear-generated energy from the plants near Port Elgin into the Hydro system. The sooner we get lines out of Bruce, the sooner we save millions of dollars from burning coal, with its accompanying pollution problems. Proposals for both the east and southwest systems have undergone intensive and costly public participation studies, and Hydro has identified preferred plans for both systems. These plans have been presented at public hearings under the new Consolidated Hearings Act — a process designed to speed up the old multi-tiered system. Following approval of these system plans, the actual route selection process begins. It still takes time, but in the long run it serves the best interests of our customers and the province.

Q. What about acid rain? Hydro is Ontario's second-largest contributor. Don't you have to set an example in cutting down on emissions?

A. That's exactly what we're doing. As we announced early in 1981, in concert with the Ministry of the Environment, Hydro is undertaking a \$600 million, 10-year program to cut acid gas emissions from our coal stations by about 50 per cent between 1982 and 1990. We'll do that despite the fact that demand for electricity will be going up by 32 per cent in the same period — and we'll maintain current levels of exports in the bargain. Hydro is responsible for two to four per cent of the acid rain that falls on sensitive areas in Ontario. Cutting that contribution in half won't in itself do much to solve the overall problem of acid rain in Ontario — after all, about two-thirds of it blows across the border from the USA — but as a public company Hydro has a responsibility to take exemplary and definite measures to deal with acid rain. On behalf of electricity customers in Ontario, that's what our program provides.

Q. Fair enough. But Hydro is planning major export sales of electricity to the United States, much of which will be coal-fired. Don't those sales run counter to Hydro's acid gas reduction program?

A. No. With or without any export sales, we're going to cut emissions in half by 1990 — that's what the law says we have to do. Of course, we're very interested

in exporting electricity. Our current surplus capacity makes that extremely attractive. It's important to remember that we're currently exporting about billion kilowatt-hours of electricity a year; in 1982 we hope to increase that amount slightly, while having reduced our acid gas emissions by 50 per cent. Both federal and provincial governments have supported the concept of exports of power — because electricity is a manufactured product, and like any manufactured good, its international sale helps Canada's balance of payments deficit. And in 1982 exports of electricity meant that everybody's Hydro bills in Ontario were 6.5 per cent lower than they would have been without exports.

Lower electricity rates in Ontario attract jobs and industry to the province. So export sales are an important part of Hydro's business. When they can exist along with a dramatic reduction in acid gas emissions, they are definitely in the best interests of Ontario and Canada.

Q. Do recent amendments to the Power Corporation Act indicate Hydro is evolving from its traditional position as an electric utility into an energy company?

A. In the past few years, the by-products of electricity generation, such as steam and hot water, have been recognized as having valuable commercial application. Steam from our Bruce nuclear plant is a case in point. Amendments to the Power Corporation Act of 1981 allow Hydro to sell steam to a marketing agent which in turn will sell it to interested industrial firms and greenhouse operators. In fact, Hydro has a number of current or potential products besides electricity, such as hydrogen, oxygen, heavy water, and tritium. Warm discharge water from our thermal and nuclear plants could also lead to fish and shrimp farms, and the production of methane. Wherever the industrial process of making electricity can help save other energies, we'll be looking at possible projects — as long as the electricity buyer in Ontario doesn't have to subsidize them.

Q. Hydro is one of the utilities most involved with nuclear energy in North America. What's your reading of current public attitudes towards nuclear in Ontario?

A. Public attitude research tells us different things generally depending on how the questions are asked. Hydro's nuclear energy program enjoys the support of the Ontario government, so obviously that's one important test of public opinion. I think most people in Ontario accept the need for nuclear energy in the province. And it's an established fact of life. Almost 35 per cent of the power we made in 1981 came from nuclear plants. Ontario Hydro's excellent safety record, and the fact that we took seven of the top places in world reactor performance in 1981, make it easy to argue the advantages to Ontario of nuclear energy. Facts tend to speak for themselves.

Does all this apparent thrust toward additional generating capacity suggest Hydro is moving away from its conservation program?

Definitely not. In fact, you can say that the cheapest and most helpful form of new generation is the megawatt we save by conservation. We have a vigorous conservation program in place. Our message to the public is use electricity wisely, and save it whenever possible. Elsewhere in this report Hydro's President comments on new incentives designed to promote effective and efficient use of electricity. These are the kinds of activities in which people want Hydro to show leadership. Heating homes with electricity will become increasingly attractive compared with heating with gas or oil, and we have an obligation to give people the facts they want to know about alternatives.

That's why we launched the Residential Energy Advisory Program (REAP) in September of 1981. This program, now available to our rural customers, is soon to be extended to the municipal utilities, gives householders free advice from energy experts on the most efficient and economical heating systems applicable to their home. We also have energy use and load management programs underway, and are involved in the Ministry of Energy's solar and heat pump programs. Anything that helps save any kind of energy — including electricity — is of interest to

Your projected capital expenditures will be substantial over the next few years. What effect will this have on Hydro's financing program and on the corporation's financial soundness?

Increased capital expenditures mean that Ontario Hydro will have to borrow more than in recent years. I feel that the amount of capital required can be reduced. While capital markets have become more volatile, Hydro has access to a wide range of financing options. The challenge for Ontario Hydro, given the high uncertainty in capital markets, is to find the right mix of financing. We don't want all our financing to be locked into today's high interest rates for the next 20 to 30 years. So I foresee an increased use of shorter term debt and other financing sources to help reduce interest costs. This is also the likely direction in which the capital markets are heading. Hydro's approach is to keep ahead of the times and is just a result of our increased capital expenditures.

The increased level of borrowing over the next few years will slow down progress toward the achievement of our desired level of financial soundness. We plan to continue raising some of the required funds through revenues. We have taken a look at our financial picture in the medium term and are confident that an acceptable level of financial

soundness can be maintained without undue upward pressure on rates.

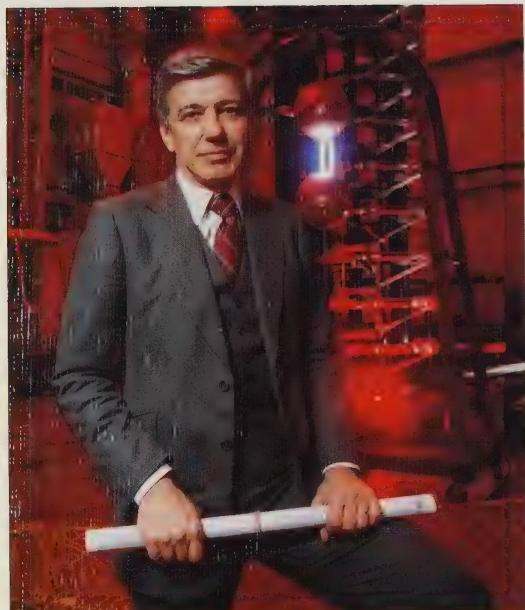
Q. In 1981, you accepted a second term as Chairman of the Board. Can you summarize your impressions of your first term?

A. They've been eventful years — to say the least. If I had to think of a catch phrase to describe what I've seen happen at Hydro over the past three years, it would be consciousness-raising. I think Hydro is much more aware of the role it plays in the social, economic, and political life of Canada. We've made considerable progress toward our goal of improving communications with the public and our employees. I'm continually impressed by the technical reputation Ontario Hydro has around the world, and I'm confident that will continue. As we become more aware of our place in the environment — both natural and man-made — I think we'll continue to improve our service to our customers and the province as a whole. An early impression of the dedication and capability of Hydro staff has remained with me over the years. The co-operation and understanding I have received — even when the issues were thorny ones — from our partners in the Ontario Municipal Electric Association, the Association of Municipal Electrical Utilities, and from the Ministry of Energy and members of the Ontario Legislature have made my job more enjoyable. And the support of Hydro Presidents Milan Nastich and Doug Gordon, along with help from Hydro employees at all levels, has been invaluable.

Q. Do the four changes on the Hydro Board of Directors in 1981 in anyway change the unique nature of your Board?

A. When Hydro changed from a commission to a special statutory corporation in 1974, it was decided the Board of Directors — appointed by the Premier — would represent almost every segment of Ontario's population. Board changes during 1981 maintained this unique representation. Retired during the year were four members of the original Board: William Dodge, former Secretary-Treasurer, Canadian Labour Congress; Allen T. Lambert, former Chairman and Chief Executive Officer, The Toronto-Dominion Bank; J. Dean Muncaster, President and Chief Executive Officer, Canadian Tire Corporation Limited; and Robert J. Uffen, Professor, Department of Geological Sciences, Queen's University. Appointed during 1981 were: J. A. Gordon Bell, President and Chief Operating Officer, Bank of Nova Scotia; Albert G. Hearn, former Vice-President, Service Employees International Union; O. John C. Runnalls, Professor of Energy Studies, University of Toronto; and Leonard N. Savoie, President and Chief Executive Officer, Algoma Central Railway.

Hydro given expanded role in Ontario's economy



Ontario Hydro President Milan Nastich

IN 1981, ONTARIO HYDRO celebrated its 75th anniversary — three-quarters of a century of growth, stability and unique technical achievement.

But it was also a year when Ontario, like the rest of the world, faced harsh economic challenges and realities. Interest and inflation rates soared, triggering a drop in capital and consumer spending and a general decline in economic growth.

High energy costs were a major factor in this economic downturn, especially as they applied to the price of oil, gas and coal. Ontario Hydro was not and is not insulated from these realities. In 1981, for instance, our fuel costs alone increased by \$89 million — the bulk of which was toward increased costs of coal.

Early in 1981, the Ontario government took aim at this economic situation and announced a major

industrial expansion program that gave Hydro a key role in contributing to the future development of the provincial economy.

Among other things, the government program looked to an economic structure for Ontario in the 1980s based increasingly on electric power and nuclear technology. And it saw this electrical power coming mainly from fuel sources indigenous to Ontario — uranium and water power.

The government program included an acceleration of construction at the Darlington nuclear station, and of our transmission and distribution upgrading programs. Measures were also included to encourage homeowners to convert from oil to electric heating and — further down the road — electrification of provincial transit systems.

Ontario Hydro is responding to these initiatives. Darlington's first two units are being advanced 12 months, and the second two by 12 months. The public participation process is proceeding toward approval of expansion of the southwestern and eastern transmission systems. An increase in hydroelectric capacity in the north-central region is in study stages, and we are progressing in developing small hydro-electric projects for remote communities. These projects, together with our efforts to help homeowners to convert from oil heating, are outlined in more detail later in this report.

Hydro's strategy, supported by the provincial government, is to reduce dependency on coal and oil-fired generation and rely increasingly on nuclear and hydro-electric capacity. These less expensive and indigenous fuel sources will not only help moderate future rate increases but, by reducing the quantity of coal burned, will lower our acid gas emissions.

Although these initiatives toward economic improvement were progressing, Hydro had to face tough economic realities. Among these was the growth rate in the demand for electricity and the rising cost of coal and oil. These factors led to decisions to mothball two units at the Lennox oil-fired station and to cancel the second unit at the light-fired station at Atikokan.

another reality facing utilities everywhere is the combined effect of inflation and high interest rates. In 1983 the cost of supplying Ontario's electricity will be \$554 million more than in 1982. The bulk of this will have to be met through increased rates. That is why we have applied to the Ontario Energy Board for an average rate increase of 13.9 per cent — slightly above the forecast rate of inflation.

Also, in the next four years we expect to borrow at varying terms a projected \$12 billion. By 1985 our annual interest charges will be roughly three times 1981 levels — close to \$2 billion.

Hydro is also facing the need to continue to meet environmental requirements as defined by various governments and agencies. These include measures to reduce acid gas, maintain the extremely high standards of nuclear safety, and appear before energy and environmental assessment boards. All these initiatives are essential if the environment in Ontario is to be maintained and improved. The public demands less than this, even though these activities are costly.

And we face other realities. Currently the people of Ontario enjoy tremendous benefits from secondary energy sales, primarily in the United States. In 1982, we estimate about \$500 million in gross revenues from this source. But it is a highly competitive market, aggressively pursued not only by Quebec and Manitoba, but by some United States utilities with spare capacity. I believe we must do everything we can to continue to supply this market so as to serve the economic benefits for Ontario.

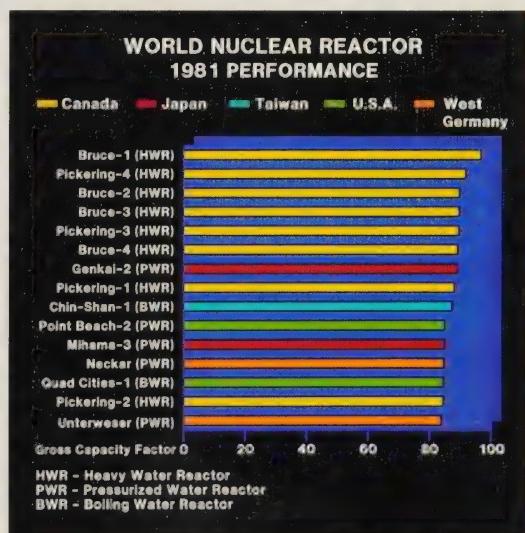
Hydro's management and staff are ready to meet these challenges. The coming decade will require of all the very best in dedication, ingenuity and flexibility. Cost effectiveness has to be the key word for Ontario Hydro in all its endeavors. Every expenditure, whether long-term or short, will need to be scrutinized to ensure that it is needed and workable.

Our past illustrates clearly we did meet our major challenges. Today, our rates are competitive, our workforce dedicated and able, and our technical achievements are world-renowned. We intend to

continue to serve the people of Ontario at the high standards to which they are accustomed.



Hydro technicians conduct routine maintenance on the reactor face at the Pickering nuclear station near Toronto.



Hydro's nuclear reactors world's top performers

Nuclear energy becomes top generation source

DESPITE THESE WINDS OF CHANGE, Hydro's primacy in providing a reliable and adequate supply of electricity continued during 1981. Primary electrical energy demand reached record heights of 101.7 billion kilowatt-hours — 1.5 per cent more than 1980 and just slightly below forecast. This shortfall resulted primarily from warm weather during April and December and strikes in the steel and pulp and paper industries.

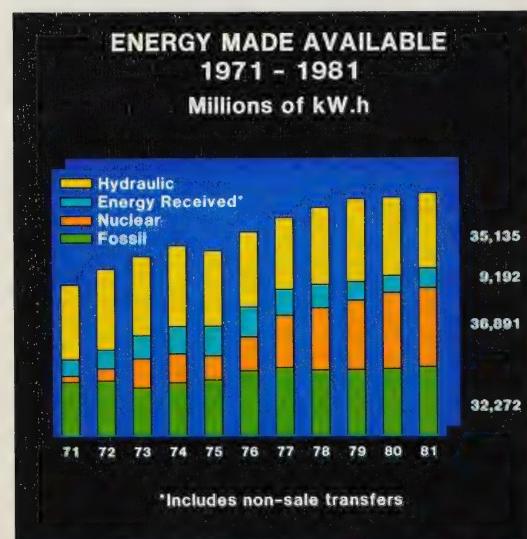
While this record demand was met from the integrated power facilities of Ontario Hydro, nuclear energy for the first time exceeded every other source of generation in our system. Of the 113.5 billion kilowatt-hours of energy supplied in 1981 — 1.7 per cent more than 1980 — nuclear sources provided 36.9 billion kilowatt-hours, water power provided 35.1 billion kilowatt-hours and coal 32.2 billion kilowatt-hours. The remainder came mostly from energy purchased from neighboring utilities and a

small amount from oil generation. And it is interesting to note that in 1981, Hydro would have had to burn an extra 12.5 million megagrams (13.8 million tons) of coal to produce the equivalent amount of electricity generated in Ontario's nuclear stations.

Again in 1981, Hydro's nuclear reactors were acclaimed among the world's best performers. Of the eight reactors operating at Bruce and Pickering, seven were in the top 10 compared with 130 large commercial reactors around the world. And this outstanding technical achievement was recorded only 10 years after the first reactors went into operation at Pickering in 1971.

After years of delays and frustrations caused by fire and faulty equipment, the coal-fired Nanticoke generating station reached its full output of 1,000 million kilowatts on December 7. Employees at the plant also set their second mark of one million man-hours without a lost-time accident on November 11. (The first period was between 1976 and 1977.)

For the first time in many years, the annual peak demand of 17.2 million kilowatts was reached on January 12 when the daily mean temperature was -18°C . This all-time high peak was 1.5 per cent above forecast and exceeded the 1980 peak established on December 17 by 2.3 per cent.



New unit at Thunder Bay helps meet northern needs

THUNDER BAY UNIT 2, with a capacity of 150,000 kilowatts, was the only new generating unit added to Hydro's power system in 1981. It was declared in-service on September 15, and Unit 3 is scheduled to be in-service by mid-1982. Both will burn low-sulphur Western Canadian lignite. Together with the single 200,000-kilowatt unit being constructed at Atikokan, the Thunder Bay extension will meet a 300,000-kilowatt increase in Northwestern Ontario demands forecast between now and 1990.

Nuclear workforce reaches 5,700

CONSTRUCTION OF THE 3.6 million-kilowatt Darlington nuclear station moved into high gear during 1981 following an April order by Hydro-



Trading of equipment in older hydro-electric stations has added substantially to Hydro's generating capacity.

Board of Directors to speed up in-service dates of the first two units by six months and the second two by 12 months. By year's end, the work force totalled 735 and will reach a peak force of 2,800 workers by 1985. The station is now scheduled for completion by 1990.

Work progressed on the four new units at Pickering 'B' and four at Bruce 'B', which will add five million kilowatts to the Hydro power system. At year's end, more than 2,000 workers were on the job at Pickering and close to 3,000 were employed on the Bruce project. These eight new reactors are sched-

uled to be progressively placed in service by 1988.

At the Bruce Nuclear Power Development, the units at Bruce Heavy Water Plant 'B' were declared in-service in March and June of 1981. Bruce Heavy Water Plant 'A', which was shut down for six months during 1981 for planned maintenance work, produced 408 megagrams (456 tons) of reactor-grade heavy water during the year, for a total Hydro production of 810 megagrams (892 tons) in 1981.

The Douglas Point nuclear station was returned to 100 per cent power in November, 1981 following approval by the Atomic Energy Control Board of modifications to the 200,000-kilowatt station's emergency coolant system.

Hydro-electric projects studied

IN 1978 HYDRO ANNOUNCED a program to study the addition of 2,000,000 kilowatts of hydro-electric power to the provincial grid by developing new sites and expanding existing plants on Ontario's northern rivers. At that time 17 sites were identified, but studies completed in 1981 showed only 10 would be economical. Of these, four involve plant expansion and six are new developments. Specific project environmental studies will be carried out for the above developments, beginning with two sites on the Little Jackfish River. The studies will assess the potential impacts caused by the development of the generating stations and a 230 kilovolt transmission linking the stations with the grid. Additional sites are being investigated for inclusion in the program.

On the St. Lawrence River, a \$5 million, two-year project was launched in 1981 to correct a warping problem affecting the 16 hydraulic generators at the Robert H. Saunders station. And at the Sir Adam Beck station at Niagara Falls, the Chippawa canals received its first clean-out in 16 years. These extensive dredging operations achieved water-flow recovery of 90 per cent.

New extra-high-voltage lines link southern power system

EXPANSION OF THE Extra High Voltage (EHV) system, begun in the 1970s, was virtually comple-



Ontario Hydro engineers assisted Hydro-Quebec in determining the causes of cracks in the buttress face at Manic 5 dam in northeastern Quebec.

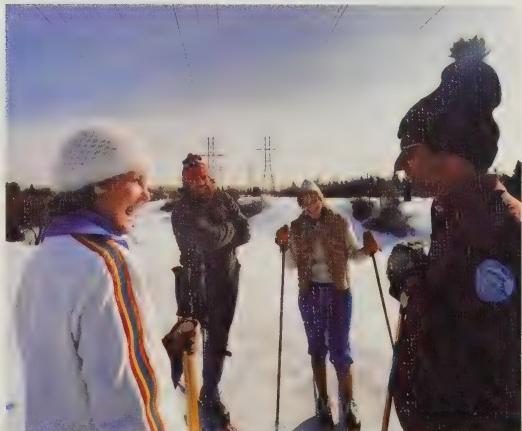


new units at the Bruce Heavy Water Plant 'B' were declared in service during 1981.

ng 1981, with the placing in service of a 45-km (9-mile) section between Cherrywood Trans-
er Station (TS) and Claireville TS; and Claireville
o Kleinburg TS. This section represents the vital
in the southern Ontario bulk transmission sys-
which connects generating stations east, west
north of Metro Toronto.

In addition to the 500-kV lines, a number of 230-kV
115-kV lines and stations projects were complet-
The new portion of the Thunder Bay generating
on was connected to the power system by com-
ing a transmission line from Thunder Bay to
Arthur Birch TS. Supply to Prince Edward
nity in eastern Ontario was reinforced through
struction of a 230-kV line from Lennox generat-
station to the Picton TS.

A new construction method for upgrading 230-kV
s developed in 1980 was successfully used in 1981.
method permits lifting of double-circuit towers



*Cross-country skiers find the rights-of-way beneath
transmission lines ideal for their winter sport.*

and installing them on new bases, without taking the line out of service.

Acid gas emissions to be cut in half by the year 1990

AS ANNOUNCED EARLY in 1981 and reiterated in the chairman's section of this report, Ontario Hydro is committed to cutting its acid gas emissions from coal-fired stations by 50 per cent by 1990.

As a leader among the world's utilities in environmental control, Hydro continues to meet all provincial government regulations on acid gas emissions. Also, Hydro has been monitoring acid gas since 1974 and has had programs in place to reduce these emissions.

Principal among these is the expansion of our nuclear and hydro-electric stations, which will reduce our need for coal-fired generation and our emissions substantially over the next 10 years. Another program involves the blending of U.S. coal with low sulphur Western Canadian coal, which reduces sulphur dioxide emissions by about 15 per cent. Hydro also buys washed coal which cuts the sulphur content by about 20 per cent.

Further reductions will be achieved by using low-sulphur Canadian lignite at the Thunder Bay station extension and at the unit being constructed at Atikokan.

In addition to these on-going programs, Hydro will spend a further \$600 million to help fulfil the 1981 agreement with the Ministry of the Environment.



The Great White Pelican, which nests near Fort Frances, is on Hydro's endangered species list.

nt limiting Hydro's acid gas emissions to 450,000 tonnes by 1986 and 300,000 tonnes by 1990. This compares with the expected 1982 levels of 600,000 tonnes.

Hydro will modify 712 burners at Nanticoke, Lambton and Lakeview stations to reduce nitric oxide levels by about 25 per cent overall. During 1982, \$3.8 million will be spent to modify burners on one unit at Nanticoke and a unit at Lakeview.

Hydro will also install flue gas scrubbers on two units at either Nanticoke or Lambton by 1986. These scrubbers, worth \$350 million, will remove about 90 per cent of the sulphur dioxide from the two units. Other measures in the program could include using increased amounts of low sulphur coal and the purchase of additional hydro-electric energy from Manitoba and Quebec.

While these programs are costly — they will mean an approximate 1.5 per cent increase in Ontario electricity rates by the mid-1980s — Hydro believes they are essential steps in the international struggle toward clean air.

Estimated cost of supplying electricity is \$3.6 billion

JANUARY, 1982 Ontario Hydro introduced rate increases averaging 9.6 per cent to the province's 324 municipal utilities, and averaging 10 per cent to about 100 large direct industrial customers. Customers of Hydro's rural system received an increase averaging 8.7 per cent. However, following an amendment to the Power Corporation Act passed by

Ontario Legislature in October, 1981, year-round, rural residential customers will be helped to reduce their electricity bills in 1982. The difference in rates between year-round, rural residential customers and urban customers will be reduced to 15 per cent at a monthly consumption of 1,000 kilowatt hours. Without this assistance, rural residential customers were forecast to have to pay an average of 28 per cent more in 1982 than their urban counterparts. The money needed for this help is provided by deducting some \$34 million from all Hydro customers in 1982 — increasing bulk power costs by

MONTHLY RESIDENTIAL ELECTRIC BILLS* 1 000 kW.h JANUARY 1982

New York	\$119
Charlottetown	100
Boston	88
Detroit	77
Chicago	72
Los Angeles	69
Tampa	64
Birmingham	56
Washington D.C.	53
Fredericton	53
Little Rock	52
Atlanta	52
St. John's	51
Halifax	49
St. Louis	47
Louisville	46
ONTARIO — Rural**	46
TVA — Rural	46
Vancouver	41
ONTARIO — Municipal Electric Utility Average	40
Calgary	38
Regina	36
Portland, Oregon	34
Montreal	34
Winnipeg	31

* Standard residential bills in local dollars including fuel cost escalators where applicable but excluding sales taxes or special local charges.

** A deduction of \$5.40 was made to reflect the monthly rate assistance provided to year-round rural residential customers.

about 1.3 per cent.

In 1983, the cost of supplying electricity will total an estimated \$3.6 billion, \$554 million more than in 1982. About \$110 million of this increase will be obtained from increased sales, leaving about \$444 million to be raised by the 1983 rate increase. Accordingly, Hydro has proposed to the Ontario Energy Board increases of 13 per cent to the municipal utilities and an average of 14.8 per cent to large direct industrial customers. Export sales to the United States in 1983 will continue to help offset the cost of supplying electricity in Ontario. Without

these sales, 1983 rates would be about 8 per cent higher than proposed.

New costing and pricing proposals

AFTER MANY YEARS of joint study and review with Hydro's bulk power customers and their representative groups, our 1983 rate increase proposals include introduction of new costing and pricing policies.

One major new policy leads to the use of time-of-use rates for billing municipal utilities, direct industrial customers and the rural retail system. Put simply, time-of-use rates recognize that the demand for electricity varies over the day and over the year. The facilities needed to meet the peak electricity demand — and the funds needed to build them — are greater than those needed to meet demand in off-peak periods. And since costs of meeting the period of peak electricity demand are higher, the price of electricity should be higher during periods of such peaks.

The major change in the policies is to base rates on an explicit set of pricing objectives. Time-of-use pricing flows from those objectives, as does a new method for determining the relative weight to be

given the demand and energy charges. This, in combination with time-of-use rates, will aid in moderating customer costs over the long term by providing an incentive to conserve energy and manage electricity demands during the daily cycle.

Hydro's 1981 fuel costs show 13.2 per cent jump in year

THE COST OF FUELS needed to power Hydro's generating stations during 1981 totalled \$763 million compared to \$674 million in 1980 — an increase of 13.2 per cent.

Total coal deliveries to generating stations from U.S. mines totalled 8.3 million megagrams (9 million tons). Contract coal shipments were supplemented by spot coal purchases to offset the shortfall of coal which resulted from the United Mineworkers of America strike earlier in the year.

Movement of Western Canadian bituminous coal through the integrated transportation system amounted to 2.0 million megagrams (2.2 million tons) delivered to Nanticoke generating station.

Deliveries of the first lignite coal from Western Canada to Thunder Bay generating station started in 1981. The initial shipments were for test burning and commissioning purposes. Deliveries totalled 0.1 million megagrams (0.6 million tons) and further contract deliveries are expected to start in 1982.

Residual oil deliveries totalled 0.07 million cubic metres (0.4 million barrels), to support the steady production requirements of the Bruce Heavy Water Plant and for reduced requirements at Lennox generating station. Commencing in 1981, natural gas was used for boiler ignition purposes only.

Total nuclear fuel deliveries to Hydro-owned stations were 970 megagrams of uranium in 1981.

Development of facilities for the production of uranium supplies under contract with two Elliot Lake producers continued in 1981, with the Denison project nearing completion. The two agreements provide for the supply of uranium concentrate containing approximately 72,000 megagrams of uranium over the period 1980 to about 2020.

In an amendment negotiated in 1981, total deliveries under the Denison contract were reduced



m 48,400 megagrams of uranium to 44,200 megagrams; the contract was also extended by one year to 2012. Hydro notified Rio Algom that it will exercise its option to reduce annual deliveries from the Stanleigh mine by 15 per cent over the next two years. This will not affect the total amount of concentrate to be supplied under the contract since the entire reserve is dedicated to Hydro.

Bulk of Hydro purchases awarded to Ontario firms

TOTAL VALUE of Ontario Hydro purchases of fuel, equipment, material and services during 1981 was \$2 billion, an increase of \$300 million from 1980. During 1981, outstanding commitments were \$2.8 billion, an increase of \$200 million from 1980. Canadian suppliers, excluding primary fuels such as uranium, coal, oil and gas, received 85.8 per cent of the total value of 1981 purchases, and of this amount 89.9 per cent was awarded in Ontario. This represents an increase of six per cent of the value of Canadian awards from 1980.

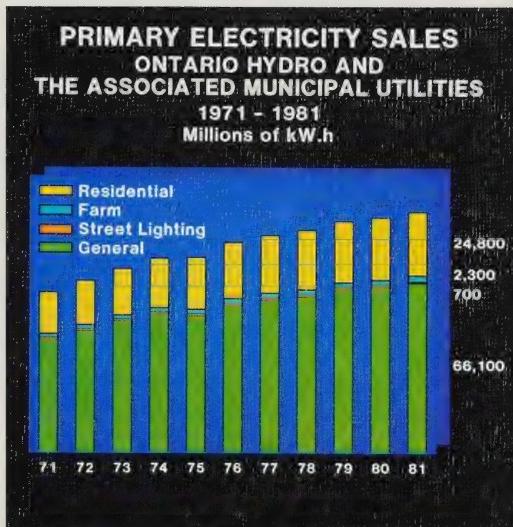
In general, the availability of material was unsatisfactory during 1981, but cost increases generally reflected inflationary trends with consequent effects on electricity prices.

Export sales help moderate rate increases in Ontario

EXPORT OF ELECTRICITY to the United States was higher than in 1980 and continued to moderate increases in the cost of electricity for Ontario customers during 1981. The net profit from such sales totalled \$100 million and this money was used to reduce Ontario electricity bills by 6.5 per cent during the year.

Part of these exports resulted from a three-year agreement reached early in 1981 — and later approved by the National Energy Board — to dedicate the total output of the J. Clark Keith generating station in Windsor to supply General Public Utilities (GPU) of New Jersey via transmission lines in Michigan and Ohio.

Other export initiatives included signing a letter



of intent with GPU for the supply of power via a proposed 105-km (63-mile) high-voltage, direct current cable running under Lake Erie. The project is estimated to cost \$800 million, with Ontario's share of the underwater cable estimated at \$275 million. Each utility would pay for its own on-shore facilities, which amounts to \$125 million in Hydro's case. It is estimated that over the 10-year life of the contract a total of \$3 billion of revenue will be received, with Ontario's net revenue reaching \$1 billion. Early in 1982 Hydro presented the proposal to the National Energy Board for approval. The NEB decision will be followed by federal and provincial Cabinet reviews.

Hydrogen fuel storage is focus of Hydro research

RESEARCH IN MANY VITAL AREAS continued throughout 1981, including the safe storage and transportation of nuclear waste, control of acid gas emissions, development of alternate energy sources and solving technical problems associated with electricity generation.

Under the terms of the federal-provincial Nuclear Fuel Waste Management Program, Ontario Hydro is responsible for studies in the interim storage and transportation of irradiated fuels. During 1981, research in this sector involved developing welding processes for the fabrication and final closure of containers for spent-fuel disposal for AECL.

Research also continued in the monitoring and the long-range atmospheric tracking of acid gases, their effects on unbuffered soil and the biological effects acid rain has on Ontario lakes.

In the field of hydrogen research — probably the



Heat and stress testing of alloys was just one of a myriad of assignments for Hydro's research division.

fuel of the 21st century — Hydro's efforts concentrated on methods of hydrogen storage as a vehicular fuel. Solar energy for water heating also came under continued study. High priority has been given to the reduction of equipment capital and installation costs to improve the cost/benefit ratios.

A major research achievement in 1981 led to developing a safe and economical way to remove polychlorinated biphenyls (PCBs) from transformer oil. The method is simple, completely contained with a byproduct of common salt and the recovered oil being reusable. Studies are now under way to ensure that byproducts and their disposal meet environmental requirements.

Alternate energy sources include hydrogen, fusion

DESIGN AND DEVELOPMENT of our electrical generation and transmission system proceeded at full pace during 1981. Also included were many aspects of Hydro's search for alternative energy sources, including active involvement in the fusion energy program and a study of hydrogen supply technology and costs was completed in June, 1981 for the Ontario Hydrogen Energy Task Force.

In the matter of irradiated fuel management, Hydro committed approximately \$4 million, primarily in the development of a facility, designed to isolate radioactive material from the environment.

Engineering studies also proceeded on control of acid gas emissions, involving flue gas desulphurization equipment and low nitrogen oxide burner for coal-fired stations.

Extensive work was also carried out with Ato-Energy of Canada Limited to demonstrate adequacy of nuclear station design at Bruce Generating Station 'A', and to provide the basis for obtaining construction approval for Darlington nuclear station.

In 1981 a contract was let to Sulzer Canada Incorporated for the design and supply of equipment for the tritium removal system at the Pickering nuclear station. Construction of the system at an estimated cost of \$67 million was approved by



• Mini-Hydel generator, pictured here at Wadell Falls, is designed to replace diesel-powered units.

Board of Directors in 1980 and is to be in service by 1985. The facility will remove radioactive tritium from the reactors and concentrate it in chemical form that can be safely stored, thereby maintaining and improving worker and public safety.

Hydro continues its policy of broad public involvement

EXPANDING FACILITIES as needed to meet future electrical demand, as well as improving system reliability, are crucial Hydro concerns. At the same time, Hydro encourages the public's participation in the planning process, even when this means longer lead times in planning expansion projects. With a commitment to this public right and by conducting innovative programs, Hydro continued its policy of public involvement in the planning of its power facilities.

In 1981, 25 provincial organizations having an interest in Hydro planning participated in the ongoing review of Hydro's public participation program.

Hydro continued to assess the effect of projects on people and communities. Social impact assessments were carried out for projects in the planning stages. Ongoing community impact management and monitoring helped to mitigate the effects of projects on communities.

After extensive public involvement — including five working groups, information centres, committees, public meetings, newsletters and news media involvement — the environmental assessment study on the system plan for the Southwestern Ontario bulk power supply project was submitted to the provincial government for review. The new transmission facilities are needed to improve the security of power supply to Southwestern Ontario, incorporate power from the four new Bruce 'B' CANDU reactors now under construction, and improve our interconnections with neighboring U.S. utilities. Public hearings into the study began in January, 1982. At the same time, hearings began on the Eastern Ontario bulk power supply study. Additional

transmission facilities are needed in Eastern Ontario to augment electrical supply to the Ottawa area and strengthen interconnections with neighboring utilities.

Environmental assessments were also completed on increasing electrical supply to the Guelph, Southeast Essex and Elliot Lake areas. In total, environmental assessments were under way on transmission projects during the year.

In December 1980, Hydro's "Class Environmental Assessment" was approved by Government. The "Class E.A." approach speeds up the formal review and decision-making procedure by enabling the Minister of the Environment to approve, following a single review, certain projects which occur frequently, are small in scale, and have acceptable environmental effects. Examples are minor transmission lines and minor transformer stations. In the first full year of "class" assessments, Hydro had 27 in progress and gained government approval for seven.

Hydro also received almost 8,000 local planning and zoning bylaws for review and challenged — with a success rate of 90 per cent — those that contravened the Corporation's right to operate and expand facilities in the public interest.

In the summer and fall, Hydro's electrical efficiency demonstration program took to the road, illustrating the effects of high-voltage power lines on people, animals and farm equipment. The demonstration program enjoyed a 10-fold audience increase in 1981.

Energy advisory program reaches rural customers

IN 1981, ADDITIONAL INITIATIVES were introduced into Hydro's conservation programs, placing special emphasis on the effective as well as efficient use of energy. Principal among these was the Residential Energy Advisory Program (REAP) in which Hydro offers its rural residential customers a complete survey of the energy efficiency of their homes at no cost. Following pilot tests of the program in three rural areas, a 10-year program was authorized by Hydro's Board of Directors in July, 1981. Later, the Ontario



Community relations staff on the fall fair circuit show farmers how to enter the electrical effects of high-voltage lines crossing their land.



Lia Vereecken-Sheehan, a diver with Hydro's Biology Services and Resources Unit, prepares for a wintry task. She will inspect strobe lights that keep fish from entering the outfall system at the Pickering nuclear generating station.

Municipal Electric Association and the Association of Municipal Electrical Utilities jointly endorsed the program and recommended that the municipal utilities implement their own REAP program.

Ontario Hydro launched the REAP program September 1, 1981, and by the end of the year more than 2,000 customers had requested and received energy surveys of their homes. Also as part of the REAP program, Hydro is making available loans up to \$2,000 to both rural and municipal customers toward the cost of improving the energy efficiency of their homes. The loans are subject to the customer first having exhausted federal energy assistance grants and paying the first \$200. The Hydro loans carry interest rates based on Hydro's current rate of borrowing.

Installation and testing of load management monitoring and control equipment continued in 1981 in 375 residences and 11 commercial buildings in Oshawa and Scarborough. Load management is designed to shift customer use of electricity from periods of high demands to times of low demand. Its objectives are to improve power system efficiency and encourage a shift of fuel dependency from less-abundant fuels — such as coal and oil which are used to meet peak demands — to more abundant and less-expensive nuclear and hydro-electric generation which provides most of the off-peak demands.

Hydro expertise in demand by many foreign countries

HYDRO IS RECOGNIZED AS A WORLD LEADER among electrical utilities, and our expertise was much in demand in other countries during 1981. A Technical Cooperation Agreement with the Korea Electric Company resulted in information exchanges between the two utilities and, through an agreement with Atomic Energy Canada Limited, 32 Hydro employees travelled to South Korea to help commission the Wolsung-1 nuclear plant. Another agreement with AECL sent a Hydro operating team of 13 to commission the Cordoba Nuclear Station in Argentina between 1981 and 1983. And teams of six and eight

respectively were sent to Pakistan and Ghana to train personnel to operate high-voltage transmission facilities.

As well, Hydro assisted AECL in designing the station and site layout and in drawing up a construction schedule for AECL's proposal to Mexico for four-unit nuclear station. If the bid is accepted — the decision is expected in the summer of 1982 — Hydro will contribute up to 50 staff to a team that would help manage the project construction and engineering functions.

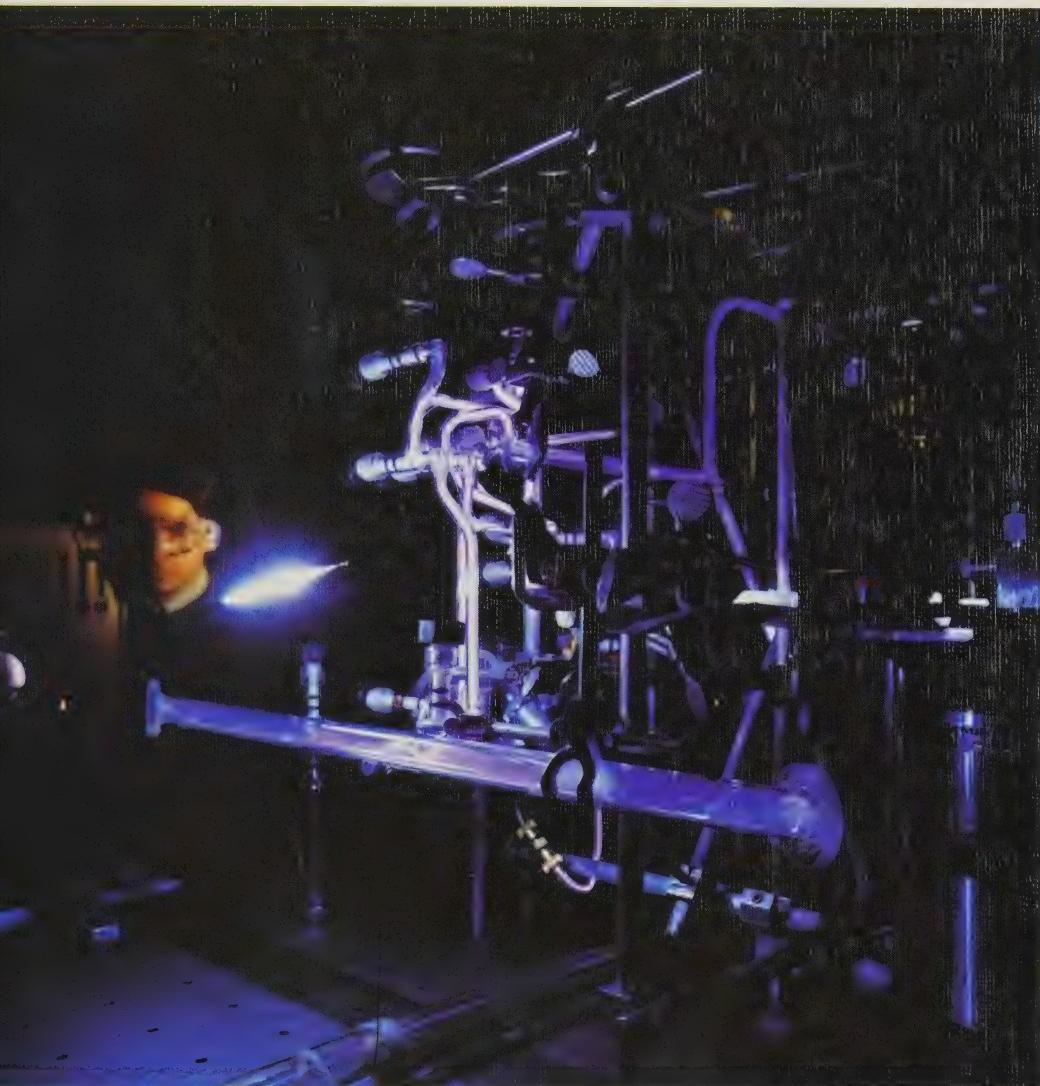
New human resources branch to encourage staff training

PEOPLE ARE HYDRO'S primary resource. In recognition of this, a Human Resources Branch was formed in 1981 to encourage actions which result in the continued dedication, productivity and job satisfaction of all employees.

In these times of intense competition for professional and technical staff, Hydro, by maintaining a high profile in the market and at the universities, was able to hire the people it needed. Furthermore, people already on staff were given opportunities to enhance their skills. All sectors of the Corporation



The workforce at the 3.6-million kilowatt Darlington nuclear plant will peak at 2,800 in 1985.



*dies to determine an economic alternative to the present process of producing heavy water
tinued at Hydro's W.P. Dobson research laboratory in Etobicoke.*

— from linemen and foresters to supervisors and professional staff — participated.

Attitude surveys and discussion with employee representatives helped keep management abreast of employee concerns and problems. Every effort was made to continue matching individual and organizational needs. By the end of 1981, more than 1,000 employees had participated in a continuing program to identify and encourage the development of staff with management potential.

Informal "straight talk" discussions between employees and senior executives became a common

practice during the year with Chairman Hugh Macaulay and myself on hand to field questions.

Equal opportunity program will broaden its focus

THROUGHOUT 1981, HYDRO continued its program designed to see that both current and prospective women employees enjoy equal selection, training and advancement opportunities with men. In 1981 Hydro exceeded its target for hiring women university graduates; held pilot career planning seminars for more than 50 non-professional staff, most of whom were women; and increased the number of females in the managerial and professional ranks of the Corporation. While this program is helping to achieve equal opportunity for women, more can and will be done in future.

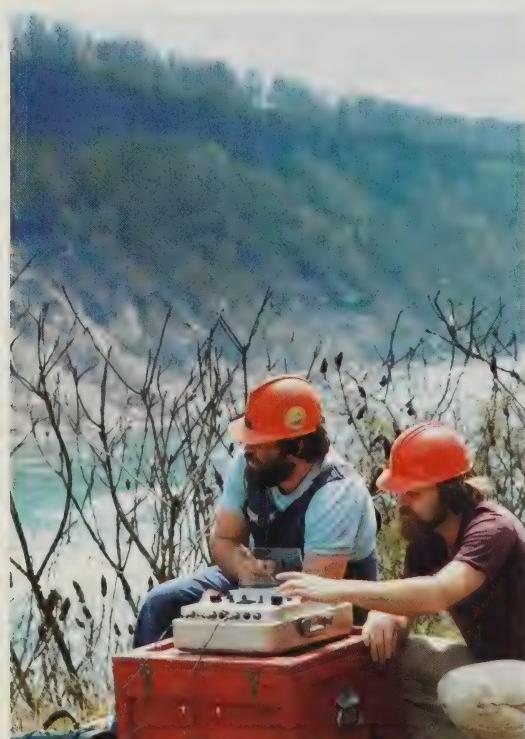
This program will also broaden its focus over time to assist traditionally disadvantaged employees by helping them to apply for job vacancies and supplying information and other assistance needed for career planning. Hydro continued its practice of determining job requirements and selecting candidates who have the abilities and experience to meet them.

Settlements reached with employees

THE SOCIETY OF ONTARIO HYDRO MANAGEMENT AND PROFESSIONAL STAFF, representing 5,700 employees, were awarded an arbitrated increase of 11.63 per cent for 1981. Topics under discussion with the Society included redress procedures, relocation assistance and the negotiating process.

In December, the parties reached a mediated settlement on 1982 compensation requiring a 10 per cent increase at the first of the year, and a further 4.45 per cent (non-compounded) in June.

The 16,000 members of the OHEU received a 7 per cent pay increase for the year beginning April, 1981 and further increases totalling 3.6 per cent during the final months of the contract year based on the cost-of-living provision in the agreement.



Hydro technicians use a seismometer to test rock stability on the banks of the Niagara River.



Clark displays the latest fashions in personnel protective equipment worn by Ontario Hydro workers.

Bargaining for a new contract was concluded on schedule and the two-year agreement increases pay by 12.8 per cent in 1982 and 10 per cent in 1983. A cost-of-living clause applying in the second year provides up to 4 per cent if the Consumer Price Index rises a similar amount beyond 10 per cent.

Hydro dedicated to improved health and safety policies

IN 1981 HYDRO both maintained its enviable safety record and introduced new safety policies and techniques dedicated to reducing the fatality rate by 50 per cent within the decade. A fall-arresting system and an energized-line warning device were developed, electricity-resistant footwear was introduced and ergonomic studies were undertaken.

Moreover, as President, I now personally review the more serious accidents. Last year, there were three occupational deaths and one total disability and a disabling injury rate of 5.1 per million man-hours — down from 5.3 in 1980.

Excellent record continues

HYDRO CONTINUED its excellent record in nuclear safety last year as radioactive emissions were generally within one per cent of Atomic Energy Control Board limits. No staff or public injuries or fatalities occurred.

As part of the continual monitoring of nuclear workers, a chromosome testing program was introduced, the first such program in Canada.

Along with the Ontario emergency planning authorities, Hydro participated in exercises on emergency response and communications capability at the Pickering and Bruce nuclear generating stations.



Members of Ontario Hydro's Board of Directors visit the Bruce 'A' nuclear generating station, home of the world's top performing reactor.



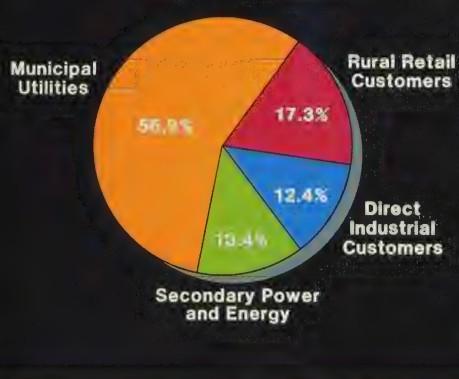
FINANCIAL SECTION

Financial Review

Ontario Hydro's revenues in 1981 totalled \$3,162 million. Primary sales of electricity to customers in Ontario amounted to \$2,737 million, while secondary sales mainly to United States utilities totalled \$425 million in 1981. Primary revenues increased 11.3% or \$278 million due to a 9.4% increase in rates and a 1.9% increase in the volume of sales. Secondary revenues increased \$64 million or 17.7% over 1980 largely as a result of higher prices for electricity sold to United States utilities. The income from these export sales reduced the costs to customers in Ontario by approximately \$0 million or 6.5%.

SOURCE OF REVENUES IN 1981

**TOTAL REVENUES
\$3,161,508,000**



The excellent performance of Hydro's CANDU nuclear reactors together with the income from export sales helped to keep the average cost of electricity to customers in Ontario below the rate of inflation. The average increase in rates for municipal utilities was 9.3%, while the average rate increases for direct industrial customers and rural retail customers were 11.4% and 11.2%, respectively. To reduce the differential between rural and urban residential electricity rates, the Province of Ontario contributed \$20 million to Ontario Hydro in 1981. These funds enabled Hydro to reduce the impact of the 11.2% rate increase on rural residential customers. Ontario Hydro's total operating costs in 1981 amounted to \$755 million compared to \$2,443 million in 1980, an increase of 12.8%. Costs increased largely as a consequence of escalating prices for fossil fuels, and continuing inflationary pressure on the costs of labour, materials and purchased services.

Energy related costs including fuel and purchased power increased 16.2% over 1980. For the first time, more electric energy was supplied by nuclear generation in 1981 than any other single source. Electric energy generated by nuclear stations supplied 33% of total energy made available, while hydroelectric stations supplied 31% and higher cost fossil-fueled

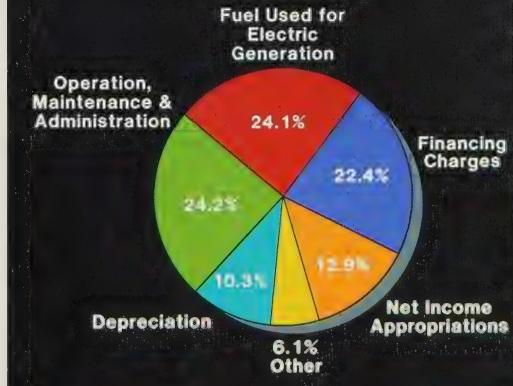
generation provided 28%. Purchases of power from interconnected utilities provided 8% of the energy available in 1981. The cost of fuel used for electric generation from all sources totalled \$763 million in 1981, an increase of \$89 million over 1980. This higher cost was a result of two factors, the increased volume of energy generated in 1981, and higher average unit costs of fuels consumed. Increased amounts of purchased power also helped to reduce the use of higher cost fossil-fueled generation in 1981. These purchases totalled \$128 million, an increase of \$28 million over 1980. In addition, payments to Atomic Energy of Canada Limited and the Province of Ontario, as required under the nuclear payout agreement, increased in total by \$14 million during 1981. These payments were made in proportion to the capital contributions of these parties to the construction of the Pickering Nuclear Generating Station units 1 and 2, and reflect the growing advantage of nuclear over coal-fired generation.

During 1981, costs associated with the operation, maintenance and administration of Ontario Hydro's in-service facilities amounted to \$765 million. This increase of \$125 million over 1980 was primarily the result of escalation in labour and other costs, and increases in the cost of operating and maintaining the generation and transmission facilities.

Depreciation costs in 1981 increased to \$325 million, up 6.1% from 1980. This increase resulted primarily from the second unit at the Thunder Bay Thermal Generating Station being placed in-service and the addition of new distribution and service facilities during the year.

APPLICATION OF REVENUES IN 1981

**TOTAL REVENUES
\$3,161,508,000**



Interest and foreign exchange costs charged to operations totalled \$709 million in 1981, \$35 million or 5.1% higher than 1980. These higher financing costs resulted primarily from a \$33 million increase in foreign exchange costs during the year, reflecting the higher level of the Corporation's foreign

debt repayable within one year and the higher exchange costs on foreign transactions during 1981. Higher interest rates during 1981 and additional borrowings for the capital construction and heavy water production programs resulted in an increase of \$204 million or 17.5% in interest costs over the previous year. As these increased interest costs were primarily associated with financing construction and heavy water production activities, the major portion of this increase was added to the cost of constructing new facilities and producing heavy water, and was not charged to operations.

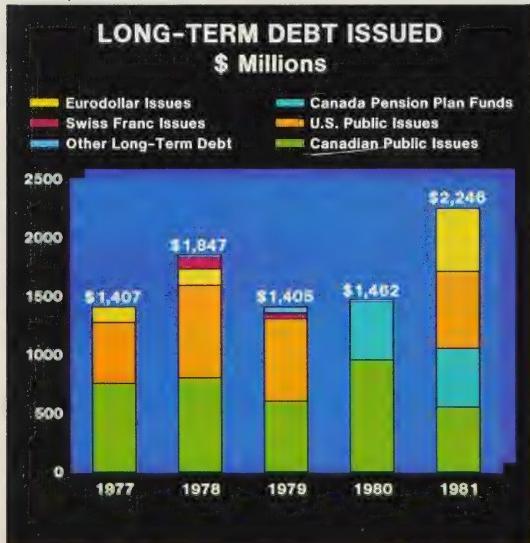
Ontario Hydro remains a financially sound Corporation as demonstrated by its interest coverage and debt ratio indicators:

Financial Indicators	1981	1980
Interest Coverage	1.30	1.32
Debt Ratio	.841	.846

Net income for 1981 was \$407 million, \$190 higher than in 1980. However, income for 1980 was reduced by an extraordinary charge of \$160 million arising from the cancellation of the Wesleyville construction project. As required by the Power Corporation Act, \$153 million of net income was appropriated for debt retirement purposes in 1981. The remaining \$254 million balance of 1981 net income was appropriated to the Reserve for the Stabilization of Rates and Contingencies.

The funds required by Ontario Hydro to finance the construction of fixed assets were provided from two major sources, operations and debt financing. In 1981, funds from operations provided \$731 million of Hydro's total requirements, while \$1,725 million was provided by debt financing. Compared to 1980, these amounts increased by \$49 million and \$865 million, respectively.

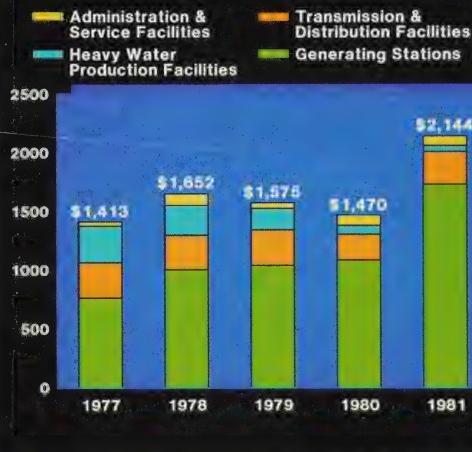
Bonds, notes and other long-term debt issued by Ontario Hydro during 1981 totalled \$2,246 million. Canadian bonds of \$550 million were sold to the public, and a further \$500 million were issued to the Province of Ontario with respect to Canada Pension Plan funds. In addition, United States bond issues of U.S. \$550 million (Cdn. \$658 million) and Eurodollar bond issues of U.S. \$450 million (Cdn. \$538 million) were issued. The average interest rate for bonds issued in 1981 was 15.2% compared to 13.0% in 1980. Maturing long-term debt amounted to \$336 million in 1981 compared to \$428 million in 1980. In addition, during 1981, \$185 million of debt was redeemed as part of Hydro's program to support the secondary market for its securities. This compares to net redemptions of \$174 million in 1980.



To provide a reliable and economic supply of electricity for the Province of Ontario, Hydro constructs new generation and transmission facilities to meet forecast peak power and energy demands. Recent Ontario Hydro forecasts predict an average annual load growth of 3.0% over the period 1980 to 2000. Based on these forecasts, Hydro has a capital construction program which provides for the addition of 8,943,000 kilowatts of generation capacity over the years 1982 to 1990 of which 8,588,000 represents nuclear generation. Recent long-range studies indicate that it is more effective to install new nuclear and hydraulic generation before adding large fossil-fueled stations. However, to satisfy system requirements in northwestern Ontario and provide diversity in the generation mix, Ontario Hydro is proceeding with construction of smaller coal-fired generating stations at Thunder Bay and Atikokan.

Net additions to fixed assets were \$2,144 million during 1981. Major capital expenditures were \$1,731 million for generation facilities including \$265 million for heavy water, \$278 million for transmission and distribution facilities, \$82 million for administration and service facilities, and \$53 million for heavy water production facilities. Net additions were \$67 million higher than those in 1980, mainly the result of

NET ADDITIONS TO FIXED ASSETS \$ Millions



increased expenditures of \$498 million on generation projects and \$149 million on production of heavy water. The expenditures on major generation projects under construction during 1981 and 1980 were:

Major Generation Projects Under Construction	1981 Expenditures \$ million	1980 Expenditure \$ million
Nuclear Generation		
Bruce "B"	628	435
Pickering "B"	368	291
Darlington	196	69
Fossil Generation		
Thunder Bay	72	89
Atikokan	93	39

During 1981, a second coal-fired unit at the Thunder Bay Generating Station was placed in service at a cost of \$30 million. In addition, the final two units of Bruce Heavy Water Plant "B" were also placed in service at a cost of \$914 million.

Summary of Significant Accounting Policies

The accompanying financial statements have been prepared by management in accordance with generally accepted accounting principles in Canada, applied on a consistent basis except for the change in accounting policy described under "Unamortized debt discount" in note 19. In management's opinion, the financial statements have been properly prepared within reasonable limits of materiality and in the light of information available up to March 8, 1982. To assist the reader in understanding the financial statements, the Corporation's significant accounting policies are summarized below:

Fixed assets

Fixed assets are capitalized at cost which is comprised of material, labour and engineering costs, plus overheads, depreciation on service equipment and interest applicable to capital construction activities. In the case of generation facilities, cost also includes the net cost of commissioning, and for nuclear generation, the cost of heavy water. The net cost of commissioning is the cost of start-up less the value attributed to energy produced by units during their commissioning period. The cost of heavy water is the direct cost of production and applicable overheads, plus interest and depreciation on heavy water production facilities. Leases which transfer the benefits and risks of ownership of assets to Ontario Hydro are capitalized.

Interest is capitalized on construction in progress at rates which approximate the average cost of long-term funds borrowed in the years in which expenditures have been made for fixed assets under construction. The effective annual rates were 11.5% in 1981 and 10.2% in 1980.

If it is decided to significantly extend the construction period of a project, interest is not capitalized on construction during the period of extension. If a project is deferred after construction has started, mothballing costs associated with the deferment are charged to operations. Interest is not capitalized on deferred projects during the period of their deferral. If a project is cancelled, all costs, including the costs of cancellation, are written off to operations.

If fixed assets are removed from service and mothballed for future use, the associated mothballing costs are charged to operations.

Depreciation

Fixed assets in service, except land, are depreciated on a straight-line basis. Depreciation rates for the various classes of assets are based on their estimated service lives, which are subject to periodic review. Any changes in service life estimates are implemented on a remaining service life basis.

The estimated service lives of assets in the major classes are:

Generation	— hydraulic	— 50 to 100 years
	— fossil and nuclear	— 30 years
Heavy water		— over the period ending in the year 2030
Transmission and distribution		— 20 to 55 years (1980 — 25 to 55 years)
Administration and service		— 5 to 60 years
Heavy water production facilities		— 20 years

In accordance with the group depreciation practices of the utility industry, for normal retirements the cost of fixed assets retired is charged to accumulated depreciation with no gain or loss being reflected in operations. However, gains and losses on sales of fixed assets, losses on premature retirements, and the costs of removal less salvage proceeds on all retirements, are charged to operations in the year incurred as adjustments to depreciation expense.

Fixed assets removed from service and mothballed for future use are amortized so that any estimated loss in value is charged to operations on a straight-line basis over their expected non-operating period.

Deferred projects are amortized so that any estimated loss in value is charged to operations on a straight-line basis over their expected deferral period. On disposal of component parts during the deferral period, the cost of fixed assets less proceeds on disposal are normally charged to accumulated amortization with no gain or loss being reflected in operations.

Unamortized advances for fuel supplies

As part of its program to ensure the adequate supply of fuels for its generating stations, Ontario Hydro has entered into long-term fuel supply contracts. Where these contracts require Ontario Hydro to make payments for pre-production costs to suppliers in advance of product delivery, these payments and associated costs, including interest, are carried in the accounts as unamortized advances for fuel supplies. The advances are amortized to fuel inventory as the fuels are delivered.

Fuel for electric generation

The cost of fuel for electric generation is comprised of fuel purchases, transportation and handling costs, and the amortization of advances for fuel supplies. Transportation costs include charges for interest and depreciation on railway equipment owned by Ontario Hydro. Fuel used for electric generation is charged to operations on the average cost basis.

Unamortized debt discount

Debt discounts or premiums arising on the issuance of debt are amortized over the period to maturity of the debt. In addition, redemption discounts or premiums on debt acquired prior to the date of maturity are amortized over the period from the acquisition date to the original maturity date of the debt. Prior to January 1, 1981,

redemption discounts or premiums were credited or charged to operations at the date of acquisition of the debt.

Nuclear agreement — Pickering units 1 and 2
Ontario Hydro, Atomic Energy of Canada Limited and the Province of Ontario are parties to a joint undertaking for the construction and operation of units 1 and 2 of Pickering Nuclear Generating Station, with ownership of these units being vested in Ontario Hydro. Contributions to the capital cost by Atomic Energy of Canada Limited and the Province of Ontario amounted to \$258 million and these have been deducted in arriving at the value of fixed assets in service in respect of Pickering units 1 and 2. Ontario Hydro is required to make monthly payments until the year 2001 to each of the parties in proportion to their capital contributions. These payments, termed "payback", represent in a broad sense the net operational advantage of having the power generated by Pickering units 1 and 2 as compared with coal-fired units similar to Lambton units 1 and 2.

Commissioning energy

Revenues from the sale of power and energy include revenues from energy produced by generating units during the commissioning period. A charge is included in the cost of operations for the value attributed to the energy produced during the commissioning period. This charge is equivalent to the operating and fuel costs of producing the same quantity of energy at generating units displaced because of the commissioning activity.

Appropriations from net income

Under the provisions of the Power Corporation Act, the price payable by customers for power is the cost of supplying the power. Such cost is defined in the Act to

include the cost of operating and maintaining the system, depreciation, interest, and the amounts appropriated for debt retirement and stabilization of rates and contingencies.

The debt retirement appropriation is the amount required under the Act to accumulate in 40 years a sum equal to the debt incurred for the cost of the fixed assets in service. The appropriation for, or withdrawal from, the stabilization of rates and contingencies reserve is an amount established to maintain a sound financial position and to stabilize the effect of cost fluctuations.

Foreign currency translation

Long-term debt payable in foreign currencies is translated to Canadian currency at rates of exchange at the time of issue. Current monetary assets and liabilities, including long-term debt payable within one year, are translated into Canadian currency at year-end rates of exchange and the resulting gains or losses, together with realized exchange gains or losses, are credited or charged to operations.

Pension plan

The pension plan is a contributory, defined benefit plan covering all regular employees of Ontario Hydro. The pension costs, as actuarially determined, include current service costs and amounts required to amortize any surpluses or unfunded liabilities. Pension plan surpluses or unfunded liabilities are amortized over a fifteen year period.

Research and development

Research and development costs are charged to operations in the year incurred, except for those related directly to the design or construction of a specific capital facility.

Auditors' Report

We have examined the statement of financial position of Ontario Hydro as at December 31, 1981 and the statements of operations, equities accumulated through debt retirement appropriations, reserve for stabilization of rates and contingencies and changes in financial position for the year then ended. Our examination was made in accordance with generally accepted auditing standards, and accordingly included such tests and other procedures as we considered necessary in the circumstances.

In our opinion, these financial statements present fairly the financial position of Ontario Hydro as at December 31, 1981 and the results of its operations

and the changes in its financial position for the year then ended in accordance with generally accepted accounting principles. Further, in our opinion, such principles, except for the change in accounting for redemption discounts or premiums on debt acquired prior to the date of maturity as described in the summary of significant accounting policies and in note 19 to the financial statements, have been applied on a basis consistent with that of the preceding year.

Toronto, Canada,
March 8, 1982.

CLARKSON GORDON
Chartered Accountants

**Statement of Operations
for the year ended December 31, 1981**

	1981	1980
	\$'000	\$'000
Revenues		
Primary power and energy		
Municipal utilities	1,800,129	1,603,072
Rural retail customers (note 1)	545,760	513,616
Direct industrial customers	391,038	341,785
	<u>2,736,927</u>	<u>2,458,473</u>
Secondary power and energy (note 2)	424,581	360,742
	<u>3,161,508</u>	<u>2,819,215</u>
Costs		
Operation, maintenance and administration	764,712	639,572
Fuel used for electric generation	762,571	673,856
Power purchased	127,919	99,490
Nuclear agreement – payback	62,801	49,038
Commissioning energy	2,858	229
Depreciation (note 3)	324,596	305,967
	<u>2,045,457</u>	<u>1,768,152</u>
Income before financing charges and extraordinary item	<u>1,116,051</u>	<u>1,051,063</u>
Interest (note 4)	657,490	655,399
Foreign exchange (note 5)	51,743	19,238
	<u>709,233</u>	<u>674,637</u>
Income before extraordinary item	<u>406,818</u>	<u>376,426</u>
Extraordinary item (note 6)	—	160,000
Net income	<u>406,818</u>	<u>216,426</u>
Appropriation for:		
Debt retirement as required by		
the Power Corporation Act	152,766	137,743
Stabilization of rates and contingencies	254,052	78,683
	<u>406,818</u>	<u>216,426</u>

See accompanying summary of significant accounting policies and notes to financial statements.

**Statement of Financial Position
as at December 31, 1981**

Assets	1981	1980
	\$'000	\$'000
Fixed assets		
Fixed assets in service (note 7)	12,489,659	10,887,3
Less accumulated depreciation	<u>2,787,400</u>	<u>1,440,0</u>
	9,702,259	9,447,0
Construction in progress (note 7)	5,381,265	4,801,2
Deferred construction projects (note 8)	<u>364,001</u>	<u>384,8</u>
	<u>15,447,525</u>	<u>13,630,1</u>
Current assets		
Cash and short-term investments (note 9)	408,441	239,1
Accounts receivable	373,309	346,8
Fuel for electric generation (note 10)	681,320	618,2
Materials and supplies, at cost	<u>157,421</u>	<u>144,1</u>
	<u>1,620,491</u>	<u>1,348,3</u>
Other assets		
Unamortized advances for fuel supplies (note 11)	596,824	414,1
Unamortized debt discount (note 19)	72,785	121,8
Long-term accounts receivable and other assets	<u>91,996</u>	<u>78,8</u>
	<u>761,605</u>	<u>614,7</u>
	<u><u>17,829,621</u></u>	<u><u>15,593,3</u></u>

See accompanying summary of significant accounting policies and notes to financial statements.

	1981	1980
	\$'000	\$'000
Liabilities		
Long-term debt		
Bonds and notes payable (note 12)	13,840,051	12,103,349
Less long-term debt (note 13)	<u>260,300</u>	<u>272,355</u>
	14,100,351	12,375,704
Bonds payable within one year	437,769	370,646
	<u>13,662,582</u>	<u>12,005,058</u>
Current liabilities		
Accounts payable and accrued charges	541,778	470,032
Short-term notes payable	97,200	144,525
Accrued interest	400,639	318,809
Long-term debt payable within one year	437,769	370,646
	<u>1,477,386</u>	<u>1,304,012</u>
Contingencies (notes 7, 8 and 14)		
Equity		
Reserves accumulated through debt retirement appropriations	1,803,662	1,651,937
Reserve for stabilization of rates and contingencies	759,296	505,645
Contributions from the Province of Ontario as assistance		
For rural construction	126,695	126,695
	<u>2,689,653</u>	<u>2,653,234</u>
	<u>17,829,621</u>	<u>15,593,347</u>

on behalf of the Board

John M. Macaulay *M. Macaulay*

President

Toronto, Canada
March 8, 1982

**Statement of Equities Accumulated through
Debt Retirement Appropriations
for the year ended December 31, 1981**

	Municipal Utilities	Power District (Rural Retail and Direct Industrial Customers)	Totals	
	\$'000	\$'000	1981	1980
Balances at beginning of year	1,158,456	493,481	1,651,937	1,516,026
Debt retirement appropriation	103,044	49,722	152,766	137,743
Transfers and refunds on annexations				
by municipal utilities	4,205	(5,246)	(1,041)	(1,832)
Balances at end of year	<u>1,265,705</u>	<u>537,957</u>	<u>1,803,662</u>	<u>1,651,937</u>

**Statement of Reserve for Stabilization
of Rates and Contingencies
for the year ended December 31, 1981**

	Held for the benefit of all customers	Held for the benefit of (or recoverable from) certain groups of customers			Totals	
		Municipal Utilities	Rural Retail Customers	Direct Industrial Customers	1981	1980
	\$'000	\$'000	\$'000	\$'000	\$'000	\$'000
Balances at beginning of year	504,411	1,144	(1,043)	1,133	505,645	426,811
Appropriation	257,196	113	(188)	(3,069)	254,052	78,681
Transfers and recoveries on annexations by municipal utilities	(144)	—	(144)	—	(288)	25
Payment to Ontario Municipal Electric Association (note 15) ...	—	(113)	—	—	(113)	(113)
Balances at end of year	<u>761,463</u>	<u>1,144</u>	<u>(1,375)</u>	<u>(1,936)</u>	<u>759,296</u>	<u>505,644</u>

See accompanying summary of significant accounting policies and notes to financial statements.

**Statement of Changes in Financial Position
for the year ended December 31, 1981**

	1981 \$'000	1980 \$'000
Source of Funds		
Operations		
Income before extraordinary item	406,818	376,426
Depreciation, a charge not requiring funds in the current year	<u>324,596</u>	<u>305,967</u>
	<u>731,414</u>	<u>682,393</u>
Financing		
Long-term debt		
Bonds and notes payable and other long-term debt issued	2,246,160	1,462,089
Less retirements	<u>521,513</u>	<u> </u>
	<u>1,724,647</u>	<u>859,979</u>
Short-term notes payable — (decrease) increase	(47,325)	124,455
Cash and investments — (increase) decrease	<u>(169,323)</u>	<u>195,410</u>
	<u>1,507,999</u>	<u>1,179,844</u>
Accounts payable and accrued interest — increase (decrease)	153,576	(119,555)
Accounts receivable and other assets — decrease (increase)	<u>7,974</u>	<u>(78,331)</u>
	<u>2,400,963</u>	<u>1,664,351</u>
Application of Funds		
Additions to fixed assets (note 16)	2,144,210	1,469,550
Amortized advances for fuel supplies — increase	182,719	146,722
Fuel, materials and supplies — increase	<u>74,034</u>	<u>48,079</u>
	<u>2,400,963</u>	<u>1,664,351</u>

accompanying summary of significant accounting policies and notes to financial statements.

Notes to Financial Statements

1. Rural retail revenues

Rural retail revenues for 1981 include \$20 million provided to Ontario Hydro by the Province of Ontario in order to reduce the differential between rural and urban residential electricity rates. These funds enabled Ontario Hydro to provide discounts to rural residential customers during 1981.

2. Secondary power and energy

Secondary power and energy is comprised mainly of revenues of \$423 million in 1981 (1980 — \$359 million) from sales of electricity to United States utilities.

3. Depreciation

	1981	1980
	\$'000	\$'000
Depreciation of fixed assets in service	382,475	334,901
Amortization of deferred construction projects	16,323	13,951
Costs of removal less salvage proceeds on retirements	4,054	2,571
	<u>402,852</u>	<u>351,423</u>
Less:		
Depreciation charged to — heavy water production	50,672	21,602
— construction in progress	21,308	17,631
— fuel for electric generation	2,266	2,241
Net gains on sales of fixed assets	4,010	3,971
	<u>78,256</u>	<u>45,464</u>
	<u>324,596</u>	<u>305,959</u>

Depreciation of fixed assets in service includes \$13 million (1980 — \$4 million) for the amortization of non-operating generating units which have been mothballed for future use. (See note 7.)

4. Interest

	1981	1980
	\$'000	\$'000
Interest on bonds, notes, and other debt	1,369,933	1,165,921
Less:		
Interest charged to — construction in progress	472,596	328,981
— heavy water production	96,537	34,341
— unamortized advances for fuel supplies	48,366	29,321
— fuel for electric generation	10,259	8,601
Interest earned on investments	84,685	72,661
Net gain on redemption of debt and sale of investments	—	36,601
	<u>712,443</u>	<u>510,521</u>
	<u>657,490</u>	<u>655,390</u>

5. Foreign exchange

	1981	1980
	\$'000	\$'000
Exchange loss on redemption and translation of foreign long-term debt	40,742	23,471
Net exchange loss (gain) on other foreign transactions	11,001	(4,211)
	<u>51,743</u>	<u>19,260</u>

6. Extraordinary item

As a result of the 1980 and 1981 forecasts projecting reduced rates of growth in future electrical demand, and the fact that studies indicated it was cost effective to install nuclear and hydraulic generation before adding more fossil-fuelled stations, the plan to complete an oil-fueled generating station at Wesleyville was cancelled effective December 31, 1980. This cancellation resulted in an extraordinary charge of \$160 million against income in 1980 to write off the construction project costs and to provide for the estimated costs of cancellation.

Fixed assets

	1981			1980		
	\$'000			\$'000		
	Assets in Service	Accumulated Depreciation	Construction in Progress	Assets in Service	Accumulated Depreciation	Construction in Progress
Generation - hydraulic . . .	1,747,545	421,769	8,454	1,733,004	390,861	11,714
- fossil	2,579,429	717,339	407,132	2,254,239	635,175	549,632
- nuclear	1,902,932	309,839	4,059,144	1,896,320	245,889	2,781,114
Heavy water	590,670	77,264	564,022	589,484	66,533	249,134
Transmission and distribution	3,680,004	852,513	302,254	3,396,803	783,017	326,307
Administration and service	602,988	234,781	40,259	547,038	200,329	24,752
Heavy water production facilities	1,386,091	173,895	-	470,464	121,513	858,640
	<u>12,489,659</u>	<u>2,787,400</u>	<u>5,381,265</u>	<u>10,887,352</u>	<u>2,443,317</u>	<u>4,801,293</u>

A result of forecasts projecting reduced rates of growth in future electrical demand, certain fossil-fueled generating units were mothballed for future use; during 1979 and 1980, five units at the R. L. Hearn Generating Station, and during 1980, two units at Lennox Generating Station were mothballed. The capital cost and accumulated depreciation of these non-operating units, amounting to \$268 million and \$89 million, respectively (1980 - \$268 million and \$76 million, respectively), are included in fossil generation assets in service. At this time it is uncertain when these units will resume operation.

Construction in progress at December 31, 1981 is comprised of:

	Remaining Number of Units Scheduled	Planned In-Service Dates	Dependable Capacity to be Placed in Service	Costs Incurred to December 31, 1981	Estimated Future Costs to Complete (Including Escalation)	
					MW	\$ millions
Fossil generating stations including heavy water)						
Pickering "B"	4	1983-85	2,064	2,138		1,509
Bruce "B"	4	1984-87	3,000	1,922		3,618
Darlington	4	1988-90	3,524	386		9,141
Nuclear generating stations						
Thunder Bay	1	1982	149	148		35
Atikokan	1	1984	206	182		482
Other construction in progress	-	-	-	<u>605</u>		-
				<u>5,381</u>		

The above estimates are the most recent forecasts as of March 8, 1982. These estimates include cost escalation which is forecast to range between 10.5% and 12.7% per year in the period 1982 to 1990. Interest is also added to the cost of construction in progress at rates which average 16.1% per year over this period. Because of long construction lead times on these projects and the uncertainties associated with the economic assumptions, the above planned in-service dates and estimated future costs to complete are subject to change.

Deferred construction projects

	1981			1980		
	\$'000			\$'000		
	Capital Cost	Accumulated Amortization	Unamortized Cost	Capital Cost	Accumulated Amortization	Unamortized Cost
Bruce Heavy Water Plant "D"	377,515	14,812	362,703	395,840	13,540	382,300
Other projects	4,983	3,685	1,298	5,724	3,175	2,549
	<u>382,498</u>	<u>18,497</u>	<u>364,001</u>	<u>401,564</u>	<u>16,715</u>	<u>384,849</u>

A result of forecasts projecting reduced rates of growth in future electrical demand, the Board of Directors made a decision to the capital construction program for Bruce Heavy Water Plant "D". In 1978, it was decided to stop construction on the second half of the plant and store the components. In 1979, it was decided to complete construction and then mothball the first half of the plant. At this time it is uncertain when the plant will be used.

9. Cash and short-term investments

	1981 \$'000	1981 \$'000
Cash and interest bearing deposits with banks and trust companies	293,059	67,0
Corporate notes	76,285	53,5
Government and government-guaranteed securities	39,097	118,5
	<u>408,441</u>	<u>239,1</u>

Corporate notes were recorded at cost which approximates market value. Government and government-guaranteed securities were recorded at the lower of cost or market value; market value as at December 31, 1981 was \$39 million (1980 — \$120 million).

10. Fuel for electric generation

	1981 \$'000	1981 \$'000
Inventories — coal	488,048	484,5
— uranium	154,977	100,6
— oil	38,295	33,1
	<u>681,320</u>	<u>618,2</u>

11. Unamortized advances for fuel supplies

	1981 \$'000	1981 \$'000
Coal	111,576	99,7
Uranium	485,248	314,3
	<u>596,824</u>	<u>414,1</u>

Based on present commitments, additional advance payments for fuel supplies will total approximately \$244 million over the next five years, including approximately \$155 million in 1982.

12. Bonds and notes payable

Bonds and notes payable, expressed in Canadian dollars, are summarized by years of maturity and by the currency in which they are payable in the following table:

Years of maturity	1981			1980		
	Principal Outstanding		Weighted Average Coupon Rate	Principal Outstanding		Weighted Average Coupon R
	Canadian \$'000	Foreign \$'000	Total	\$'000	\$'000	Total
1981	—	—	—			
1982	206,434	213,127	419,561			
1983	171,043	201,906	372,949			
1984	100,077	114,096	214,173			
1985	564,965	293,178	858,143			
1986	—	148,118	148,118			
1 — 5 years	1,042,519	970,425	2,012,944	9.0%	2,191,387	8.9%
6 — 10 years	249,862	1,188,943	1,438,805	11.7	770,260	7.5
11 — 15 years	605,709	284,372	890,081	8.3	558,705	8.5
16 — 20 years	2,414,949	542,812	2,957,761	10.7	2,363,264	9.3
21 — 25 years	1,446,162	1,008,449	2,454,611	9.6	2,805,764	9.3
26 — 30 years	1,763,070	2,322,779	4,085,849	10.8	3,413,969	10.0
	<u>7,522,271</u>	<u>6,317,780</u>	<u>13,840,051</u>		<u>12,103,349</u>	
Currency in which payable						
Canadian dollars		7,522,271			6,823,253	
United States dollars		6,185,064			5,132,709	
West German Deutsche marks		75,992			90,663	
Swiss francs		56,724			56,724	
		<u>13,840,051</u>			<u>12,103,349</u>	

The bonds and notes payable in United States dollars include \$4,502 million (1980 — \$3,949 million) of Ontario Hydro bonds held by the Province of Ontario and having terms identical with Province of Ontario issues sold in the United States on behalf of Ontario Hydro. Except for these bonds and \$1,000 million (1980 — \$500 million) of bonds issued by the Province of Ontario with respect to Canada Pension Plan funds advanced to Ontario Hydro, all bonds and notes payable are guaranteed as to principal and interest by the Province of Ontario.

The long-term bonds and notes payable in foreign currencies are translated into Canadian currency at rates of exchange at time of issue. If translated at year-end rates of exchange, the total amount of these liabilities would have been increased by \$681 million at December 31, 1981 (1980 — \$794 million).

Other long-term debt

	1981 \$'000	1980 \$'000
balance due to Atomic Energy of Canada Limited for the purchase of Bruce Heavy er Plant "A". Under the purchase agreement, Ontario Hydro pays equal monthly alments of blended principal and interest to December 28, 1992, with interest at the of 7.795%	187,107	197,549
capitalized lease obligation for the head office building at 700 University Avenue, Toronto. The lease obligation is for the 30-year period ending September 30, 2005, payable in United States dollars at an effective interest rate of 8%	41,889	42,455
capitalized lease obligations for transport and service equipment. Under these agreements, monthly instalments of blended principal and interest will be paid to 1988, at effective interest rates ranging from 6.8% to 22.75%	<u>31,304</u>	<u>32,351</u>
	<u>260,300</u>	<u>272,355</u>

Payments required on the above debt, excluding interest, will total \$99 million over the next five years. The amount
payable within one year is \$18 million (1980 — \$16 million).

Fuel used for electric generation

Ontario Hydro has contracted with Petrosar Limited for the purchase of 20,000 barrels of residual fuel oil per day
through April 1992. Deliveries in 1981 were 6% (1980 — 18%) of the contract quantities. Ontario Hydro is currently
negotiating with Petrosar Limited the implications of lower than contracted deliveries. An amount was charged to the
cost of operations to provide for settlement with respect to reduced deliveries in 1980 and 1981.

Payment to Ontario Municipal Electric Association

The amount of this payment is equivalent to interest on the balance held for the benefit of Municipal Utilities in the
Fund for Stabilization of Rates and Contingencies.

Net additions to fixed assets

Additions to fixed assets are capital construction expenditures less the proceeds on sales of fixed assets. In 1981,
additions to fixed assets reflect proceeds on sales amounting to \$8 million (1980 — \$76 million). For 1982, net
additions to fixed assets are estimated to be \$3,034 million.

Pension plan

The most recent actuarial valuation of Ontario Hydro's pension plan as at December 31, 1980 reported a surplus of
approximately \$17 million (December 31, 1979 — \$81 million).

Significant actuarial assumptions used in the 1980 valuation (1979 valuation) were:

- rate used to discount future investment income 8.5% (1979 — 7%) and future benefits 8% (1979 — 7%)
- salary escalation rate 8% (1979 — 6.75%)
- average retirement age for males 61.8 (1979 — 62.2) and for females 60.8 (1979 — 61.9)
- common stock valuation 5 year average (1979 — 5 year average)

The effect of the above changes in valuation assumptions, partially offset by the experience surplus for 1980, reduced
the pension plan surplus by \$64 million.

Pension plan costs for 1981 were \$60 million (1980 — \$43 million), after a reduction of \$1 million (1980 — \$7
million) for the amortization of pension plan surplus.

Research and development

In 1981, approximately \$50 million of research and development costs were charged to operations and \$5 million
was capitalized (1980 — \$41 million and \$4 million, respectively).

Change in accounting policy

Effective January 1, 1981, redemption discounts or premiums on debt acquired prior to the date of maturity are being
amortized over the period from the acquisition date to the original maturity date of the debt. Prior to January 1, 1981,
the redemption discounts or premiums were credited or charged to operations at the acquisition date of the debt.
This change has been applied on a prospective basis because of the nature of the environment in which Ontario Hydro
establishes its power rates. The effect of this change has been to decrease net income for the year ended December
31, 1981 by approximately \$90 million. This amount has been reflected as a reduction from the unamortized debt
balance as shown in the statement of financial position as at December 31, 1981.

The Pension and Insurance Fund Statement of Assets as at December 31, 1981

	1981	1980
	\$'000	\$'000
Fixed income securities		
Government and government-guaranteed bonds	174,316	299,974
Corporate bonds	283,183	173,055
First mortgages	<u>369,000</u>	375,340
Total fixed income securities	<u>826,499</u>	848,369
Equities — corporate shares	449,051	343,282
Cash and short-term investments	<u>142,978</u>	72,283
Total investments	<u>1,418,528</u>	2,243,934
Accrued interest and dividends	24,384	17,224
Receivable from Ontario Hydro	<u>2,630</u>	2,965
	<u>1,445,542</u>	<u>1,284,123</u>

Notes

1. Accounting Policies

In the above statement of assets which is prepared on the accrual basis of accounting, bonds are included at amortized cost, first mortgages at balance of principal outstanding and shares at cost. Total bonds and shares at December 31, 1981 with a book value of \$907 million had a market value of \$954 million (1980 — \$816 million and \$928 million, respectively).

2. Actuarial Valuation

The most recent actuarial valuation of Ontario Hydro's pension plan at December 31, 1980 reported a surplus of approximately \$17 million (December 31, 1979 — \$81 million). Pension plan surpluses or unfunded liabilities are amortized over a fifteen year period.

Auditors' Report

We have examined the statement of assets of The Pension and Insurance Fund of Ontario Hydro as at December 31, 1981. Our examination was made in accordance with generally accepted auditing standards, and accordingly included such tests and other procedures as we considered necessary in the circumstances.

In our opinion, the accompanying statement presents fairly the assets of the fund as at December 31, 1981 in accordance with the accounting policies described in note 1 applied on a basis consistent with the preceding year.

Toronto, Canada,
March 8, 1982.

CLARKSON GORDON
Chartered Accountants

Five Year Summary of Financial Statistics

	1977	1978	1979	1980	1981
	(in thousands of dollars)				
Revenues					
Primary power and energy					
Municipal utilities	1,108,099	1,275,107	1,441,557	1,603,072	1,800,129
Rural retail customers	407,382	442,224	474,795	513,616	545,760
Direct industrial customers	243,560	261,816	305,210	341,785	391,038
Secondary power and energy	1,759,041	1,979,147	2,221,562	2,458,473	2,736,927
Total revenues	210,046	288,533	346,558	360,742	424,581
Less excess revenues ⁽¹⁾	1,969,087	2,267,680	2,568,120	2,819,215	3,161,508
Less excess revenues ⁽¹⁾	122,093	130,292	—	—	—
Total revenues	1,846,994	2,137,388	2,568,120	2,819,215	3,161,508
Operating costs					
Operation, maintenance and administration	414,307	501,800	601,422	639,572	764,712
Fuel used for electric generation	441,902	487,037	605,839	673,856	762,571
Depreciation	215,601	265,060	284,610	305,967	324,596
Other	177,807	166,751	154,427	148,757	193,578
Total operating costs	1,249,617	1,420,648	1,646,298	1,768,152	2,045,457
Income before financing charges and extraordinary item					
Total income before financing charges and extraordinary item	597,377	716,740	921,822	1,051,063	1,116,051
Financing charges					
Interest on bonds, notes and other debt	753,251	899,817	1,029,568	1,165,921	1,369,933
Capitalized interest	(283,624)	(304,119)	(341,073)	(401,254)	(627,758)
Investment income	(62,075)	(76,249)	(105,163)	(109,268)	(84,685)
Foreign exchange (gain) loss	407,552	519,449	583,332	655,399	657,490
Interest on bonds, notes and other debt	(3,724)	29,346	70,875	19,238	51,743
Total financing charges	403,828	548,795	654,207	674,637	709,233
Income before extraordinary item					
Extraordinary item	—	20,500	—	160,000	—
Total income before extraordinary item	193,549	147,445	267,615	216,426	406,818
Total income	193,549	147,445	267,615	216,426	406,818

Footnotes on page 39.

	1977	1978	1979	1980	1981
(in mills per kilowatt-hour of total energy delivered)					
Average revenue per kilowatt-hour⁽²⁾⁽⁷⁾					
Primary power and energy					
Municipal utilities	18.99	20.81	22.76	24.70	27.
Rural retail customers	31.28	34.21	36.49	39.70	42.
Direct industrial customers	16.04	17.72	19.37	20.80	22.
Secondary power and energy	24.63	27.76	29.72	33.63	38.
All classifications combined	20.71	22.82	24.75	26.85	29.
(expressed as a %)					
Average rate increases⁽¹⁾					
Municipal utilities	30.3	9.4	9.8	8.6	9.
Rural retail customers	25.6	9.8	7.0	6.2	11.
Direct industrial customers	32.3	10.3	10.1	7.1	9.
(in mills per kilowatt-hour of energy generated)					
Average cost per kilowatt-hour⁽³⁾⁽⁷⁾					
Hydraulic					
Operation, maintenance and administration78	.86	.98	1.09	1.
Fuel — water rentals44	.48	.52	.58	.
Depreciation and financing charges	<u>3.25</u>	<u>3.39</u>	<u>3.26</u>	<u>3.24</u>	<u>3.</u>
	<u>4.47</u>	<u>4.73</u>	<u>4.76</u>	<u>4.91</u>	<u>5.</u>
Nuclear					
Operation, maintenance and administration	2.91	3.12	3.32	3.49	4.
Fuel — uranium	1.29	1.61	1.94	2.39	2.
Depreciation and financing charges.	<u>6.54</u>	<u>8.69</u>	<u>9.26</u>	<u>7.65</u>	<u>8.</u>
	<u>10.74</u>	<u>13.42</u>	<u>14.52</u>	<u>13.53</u>	<u>14.</u>
Fossil					
Operation, maintenance and administration	2.49	2.98	3.27	3.42	3.
Fuel — coal, gas and oil	13.17	15.42	17.08	18.56	21.
Depreciation and financing charges.	<u>5.18</u>	<u>6.90</u>	<u>7.15</u>	<u>6.46</u>	<u>6.</u>
	<u>20.84</u>	<u>25.30</u>	<u>27.50</u>	<u>28.44</u>	<u>30.</u>

See footnotes on page 39.

	1977	1978	1979	1980	1981
	[in thousands of dollars]				
Financial position					
Total assets	11,385,635	13,162,506	14,513,729	15,593,347	17,829,621
Fixed assets	9,953,978	11,340,961	12,628,842	13,630,177	15,447,525
Long-term debt	8,695,853	10,226,763	11,134,185	12,005,058	13,662,582
Equity	1,656,763	1,802,793	2,069,538	2,284,277	2,689,653
Major sources of funds					
Operations	409,150	433,005	552,225	682,393	731,414
Bonds and notes payable and other long-term debt — net increase	1,130,065	1,489,912	1,117,050	859,979	1,724,647
Major application of funds					
Net additions to fixed assets	1,413,120	1,652,043	1,574,716	1,469,550	2,144,210
Amortized advances for fuel supplies — net increase	57,169	45,626	126,680	146,722	182,719
Financial indicators					
Interest coverage ⁽⁴⁾	1.26	1.19	1.26	1.32	1.30
Debt ratio ⁽⁵⁾844	.853	.848	.846	.841
Return on average rate base (%) ⁽⁶⁾	9.3	9.4	10.1	10.8	11.3

Notes

Ontario Hydro was required by the Province of Ontario to conform with the spirit and intent of the Federal Anti-Inflation program as applied to net income for the years 1977 and 1978. Excess revenues were applied to reduce customers' bills in 1978, 1979 and 1980.

Figures for 1977 and 1978 are before deduction of excess revenues. (See footnote 1.)

Average cost per kilowatt-hour represents the costs attributable to generation but excludes the costs related to transmission, distribution and corporate administrative activities. These figures reflect the historical accounting costs of operating facilities and the actual energy generated by these facilities during the year.

Interest coverage represents income before extraordinary item plus gross interest (interest on bonds and notes payable, short-term notes payable and other long-term debt) divided by gross interest.

Debt ratio represents debt (bonds and notes payable, short-term notes payable and other long-term debt) divided by debt plus equity.

Return on average rate base represents income before extraordinary item plus gross interest (interest on bonds, notes and other debt) divided by average rate base (total assets less accounts payable and accrued charges, accrued interest, and contributions from the Province of Ontario as assistance for rural construction).

Figures for 1981 are preliminary.

COMPARATIVE STATISTICS

	1981	1980	1979	1976	1975
Operating					
Dependable peak capacity ('000 kW)	24,595*	24,457*	24,429*	19,677	13,942
December primary peak demand ('000 kW)	16,600	16,808	16,365	15,896	11,550
Primary energy made available ('000,000 kW•h)	101,659	100,174	98,127	90,853	68,137
Customer					
Primary energy sales ('000,000 kW•h)					
Municipal utilities	66,421**	64,899	63,349	57,635	41,710
Rural retail	12,745**	12,936	13,011	12,436	8,210
Direct industrial	17,077**	16,432	15,757	14,071	13,710
Total	96,243**	94,267	92,117	84,142	63,770
Secondary energy sales ('000,000 kW•h)	11,063**	10,727	11,662	4,157	4,000
Total Ontario customers ('000)					
Residential	2,540**	2,493	2,449	2,297	2,000
Farm	110**	112	113	121	100
Commercial and industrial	328**	322	316	292	200
Total	2,978**	2,927	2,878	2,710	2,400
Average annual kW•h per customer					
Residential	9,860**	9,821	9,839	9,708	8,000
Farm	20,978**	19,978	19,225	16,955	13,000
Commercial and industrial	202,900**	202,582	204,113	198,722	175,600
Average revenue per kW•h (\$)					
Residential	3.96**	3.60	3.22	2.23	1.00
Farm	4.18**	3.74	3.42	2.46	1.00
Commercial and industrial	2.88**	2.66	2.35	1.63	1.00
Staff, average for year	30,850	28,902	28,385	24,123	23,200

*Includes mothballed generation; 1981 – 1,913,000 kW; 1980 – 1,704,000 kW; 1979 – 550,000 kW.

**Preliminary

BOARD OF DIRECTORS

F/M	J. A. Gordon Bell , Thornhill President and Chief Operating Officer Bank of Nova Scotia
M/S/T	Arthur J. Bowker , Ottawa Vice-Chairman, Ontario Hydro Chairman, Technical Advisory Committee Research Officer National Research Council
A/S	Alan B. Cousins , Wallaceburg President, Ideal Stampings Limited
A/F/T	A. Ephraim Diamond , Toronto Chairman, Audit Committee President Whitecastle Investments Limited
A/S	Albert G. Hearn , Agincourt Former Vice-President Service Employees International Union
S	J. Conrad Lavigne , Timmins President, Mid Canada Television System
F/S	Philip B. Lind , Toronto Chairman, Social Responsibility Committee Senior Vice-President Rogers Cablesystems Limited
M/S/T	Hugh L. Macaulay , Toronto Chairman, Ontario Hydro Chairman, Finance Committee Chairman, Management Resources Committee
A/S	Sister Mary , Toronto Executive Director St. Michael's Hospital
F/T	Milan Nastich , Toronto President, Ontario Hydro
M/T	O. John C. Runnalls , Toronto Professor, Energy Studies University of Toronto
M/T	Leonard N. Savoie , Sault Ste. Marie President and Chief Executive Officer Algoma Central Railway
M/S	William A. Stewart , London Former Ontario Minister of Agriculture and Food
A	Member of the Audit Committee
F	Member of the Finance Committee
M	Member of the Management Resources Committee
S	Member of the Social Responsibility Committee
T	Member of the Technical Advisory Committee

(As of December 31, 1981)

OFFICERS

Chairman of the Board	Hugh L. Macaulay
Vice-Chairman	Arthur J. Bowker
President	Milan Nastich
Executive Vice-Presidents	Patrick G. Campbell
Executive Vice-President Operations	Arvo Niitenberg Executive Vice-President Planning & Administration
Vice-Presidents	E. H. (Ted) Burdette Vice-President Finance
	L. A. (Vern) Coles Vice-President Distribution & Marketing
	Frank W. Gomer Vice-President Human Resources
	Sam G. Horton Vice-President Supply & Services
	H. Allen Jackson Vice-President Design & Construction
	John G. Matthew Vice-President Power System Program
	Dane B. MacCarthy Vice-President Corporate Relations
	Lorne G. McConnell Vice-President Production & Transmission
	Harold A. Smith, M.B.E., F.R.S.C. Vice-President Special Assignments (Retired May 1, 1981)
	Secretary and General Counsel William E. Raney, Q.C.
	Treasurer Dirk Peper
	Corporate Comptroller Ron W. Bartholomew

REGIONAL DIRECTORS

Central Region	H. K. Wright 5760 Yonge Street Willowdale M2M 3T7
Eastern Region	P. J. Garlough 420 Dundas St. East Belleville K8N 5C3
Georgian Bay Region	F. A. Pertulla 93 Bell Farm Road Barrie L4M 1H1
Niagara Region	J. W. H. Kerr Box 157, 1053 Main St. West Hamilton L8N 3B9
Northeastern Region	C. G. Sanford 590 Graham Drive North Bay P1B 8L4
Northwestern Region	J. D. Hamer 34 Cumberland St. North Thunder Bay P7A 4L5
Western Region	E. G. Bainbridge 1075 Wellington Road London N6E 1M1 (Dr. D. A. Drinkwater, Deputy Director)

THE CORPORATION

ONTARIO HYDRO is a special statutory corporation established by the provincial Legislature in 1906 with broad powers to generate, supply and deliver electric power throughout the province.

The Corporation's primary responsibility is to provide power to municipalities — over which it has certain regulatory functions — which in turn distribute the power to customers in their areas. Hydro also supplies more than 100 direct industrial customers and about 760,000 retail customers in rural areas not served by municipal utilities.

In 1981 Hydro's mandate was broadened slightly by two amending acts of the Ontario Legislature. One amendment requires Hydro each year to forecast, for the following year, the differential between rural residential billings and municipal utility residential billings and to discount rural residential rates, if necessary, to reduce the forecast differential to 15 per cent.

The second amending act authorizes Hydro to provide an energy conservation program encouraging the safe and efficient use and conservation of all forms of energy. The act also authorized the Corporation to produce, sell, supply and deliver steam and hot water as primary products from new or existing facilities.

Hydro is part of a massive electric grid providing interconnections with Manitoba Hydro on the west, Hydro-Quebec on the east, and with utilities in New York and Michigan states to the south.

Hydro is governed by the Power Corporation Act, Revised Statutes of Ontario, 1980, c. 384 as amended, which sets out that electrical power and electrical energy be provided to municipal customers at cost. This includes charges for operation, maintenance, administration, depreciation, fixed charges and reserve adjustment. Also included is the cost of the energy conservation program and any difference in revenue resulting from the rural rate differential adjustment. Fixed charges include interest and expenses of debt service and the provisions for the retirement of debt over a 40-year period.

The Province of Ontario guarantees the payment of the principal and interest on bonds and notes issued to the public by Ontario Hydro. In the case of public borrowing in the United States, the Province borrows on behalf of Hydro by issuing its own debentures and advancing the proceeds to Ontario Hydro upon terms and conditions agreed upon between the Corporation and the Treasurer of Ontario.

Ontario Hydro is administered by a Board of Directors consisting of a chairman, a vice-chairman, a president and not more than 10 other directors. Regular review of strategy, programs and resources is a function of the Executive Office, composed of the chairman, the president, the two executive vice-presidents and the secretary and general counsel.



PROVINCE
OF
ONTARIO

ONTARIO HYDRO 1982 ANNUAL REPORT

CAZON
EP
- A55



Report of the Board of Directors of Ontario Hydro for the Year 1982

The Honourable Robert Welch
Minister of Energy

On behalf of my predecessor Chairman Hugh Macaulay and the Board of Directors, I submit to you this report of the financial position and relevant Ontario Hydro activities for the year 1982. We would like to thank you and the staff of the Ministry of Energy for the cooperation and understanding extended during the year.

Milan Nastich

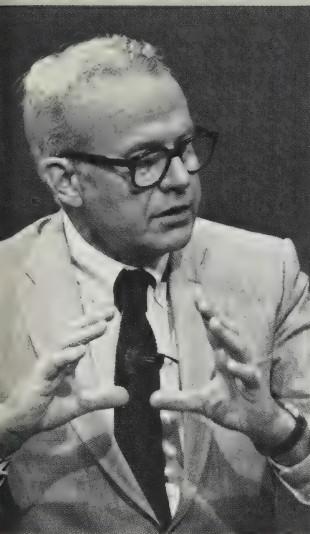
Milan Nastich
May, 1983

Contents

Chairman's comments	1
President's report	4
Energy supplied	6
Rates and revenue	10
Customer programs	14
Environment	16
Employees	18
Research	20
Board and management	22
Financial section	23

Comments from the Chairman

•• There's a tough transition ahead
- Hydro is going to have to redirect all of its resources. ••



Chairman Hugh Macaulay*

The year 1982 may well be remembered as a turning point in the evolution of Ontario Hydro. It was a year when Hydro, like any other business in Canada, had to face squarely the challenges of a slumping world economy — a year in which Hydro had to re-examine its goals and objectives to better serve the needs of its customers.

Hydro has a record to be proud of — 76 years of reliability, service and unsurpassed technological achievements. It's because of this record, because of these strengths, that I'm confident Hydro can adapt when changing times dictate changing direction.

That's not to say there isn't a tough transition ahead. Hydro is going to have to redirect all of its resources to deal with slower growth, higher costs and the financial uncertainties of the current economic climate.

In the past, and especially in the '60s and '70s, we had our work cut out for us building generating stations to meet the demands of an energy-hungry province. To that end, Hydro is now seeing some of its hard work realized.

In 1982, the first of four nuclear reactors at Pickering B Generating Station began producing power, while construction continued at the Bruce B and Darlington nuclear generating stations. With so many businesses today shying away from energy megaprojects, Hydro is completing three of Canada's most ambitious large-scale projects and providing thousands of jobs for the Ontario economy.

Now Hydro is turning to new demands — looking at ways to use more efficiently the resources it already has.

Over the past year, the Corporation has been developing a new strategy designed to result in a more efficient, customer-oriented Hydro. It will demand cutbacks and no small sacrifice as Hydro works to develop an organization responsive to tough times and changing patterns of energy use.

We have already taken some major steps in this direction, as the record shows. During 1982, Hydro cancelled or deferred several large capital projects, slashed operating budgets and took measures to reduce wage and salary costs beyond those required by the provincial government's restraint program.

There will be more cost-cutting in the future. But electricity customers can still be assured of a high level of service and reliability from their utility.

As I've said, Hydro has many strengths to help it face the challenges of the '80s and '90s. Not the least of these is its people — hardworking, resourceful and dedicated. I am confident their efforts will ensure that Hydro responds to Ontario's changing energy needs with vigor and creativity.

On behalf of the Board of Directors, I would like to thank Sister Mary, Conrad Lavigne and Philip Lind for their valuable contributions to the work of the Corporation during their time on the Board. As well, I would like to welcome new appointees John Cronyn, Isobel Harper and John Erickson.

Our thanks are also extended to Ontario's municipal utilities and their associations, the Ontario Municipal Electric Association and the Association of Municipal Electrical Utilities, for their cooperation and their unfailing service to the people of Ontario.

On a personal note, I wish to express my deep appreciation to my colleagues on the Board, to senior management — particularly President Milan Nastich — and to all those Hydro people who have helped make my term as Chairman the most stimulating and rewarding years of my career.

Hugh Macaulay

Hugh Macaulay retired as Chairman of the Board of Directors March 31, 1982. President Milan Nastich was appointed interim Chairman for a month term effective April 1, 1983.

A conversation with Hugh Macaulay

What was the most significant factor affecting Ontario Hydro in 1982?

Without a doubt, the economic recession, especially the drop in industrial demand for electricity. For the first time since World War II, people in Ontario used less electricity than they did the year before. Not much less, but less. The rate of growth in electricity use has been slowing down since 1977, but coping with an actual drop has meant a fundamental adjustment for an organization that for decades has been geared to doubling the capacity of its system every 10 years.

The immediate result was that Hydro earned less revenue than expected — we had fewer dollars to do the job of providing electricity for our customers. It became clear early in the year that Hydro had to squeeze more out of its resources, make do with less and take a hard look at some of its planned projects. Thanks to a strong staff effort we did succeed in bringing costs more in line with revenues during the latter part of the year.

Ontario Hydro indicates in its new corporate strategy that one of its goals is to hold rate increases to no more than the rate of inflation. Will Hydro be able to do this?

Looking at the average increase over a number of years, I think the answer is yes. Individual years may be higher or lower, but look at our record. Over the past four years, the real price of electricity declined 7 per cent following a period of substantial increases.

In the next two or three years, we may be seeing real increases in the price of electricity again as we start charging customers for the accumulated interest on new nuclear plants coming into service. This situation will probably change

by the late 1980s, especially if industrial demand for electricity picks up as we expect it will. Over the decade, we'll see that electricity prices have remained very stable, especially compared with other forms of energy like natural gas and oil.

With revenue from power sales down and a commitment to keep a tight lid on rate increases, is Hydro's borrowing program affected?

Certainly, there's a temptation to lean more heavily on capital markets — a lot of pressures point toward increased borrowing. But there are some countervailing pressures as well. There's a definite limit to how much money is available to Hydro at the right price and to the total amount of funds we can borrow if we want to maintain our financial health and provide for future rate stability. Hydro already has a major borrowing program — the production of electricity is a capital intensive business — and this program will have to continue. But, particularly in the present economy, we have a responsibility not to put undue pressure on the market or take more than our share of funds.

Ontario Hydro has been encouraging its customers to practice conservation, yet it is stepping up efforts to encourage them to use electricity in place of other forms of energy. Why?

Because we believe that both conservation and substitution are in the best interest of our customers.

We encourage conservation because it is neither economic nor responsible to waste energy.

We encourage substitution because getting off oil is a national and provincial priority, and electricity is a good alternative. Ontario, like its neighboring provinces, has surplus electrical generating capacity. Not to use efficient, new generating stations which have been built and are being paid for can be a waste too — a waste of the money and material resources that went into them.

You mentioned that Ontario Hydro has made an effort to reduce costs. Will this have an effect on Hydro's commitment to reduce the impact of its operations on the environment?

I don't think the people of Ontario will permit that. Until recently, it used to be that in tough economic times concerns for the environment faded into the background as people became preoccupied with their personal security. We have more unemployment in Canada now than we've had in decades, yet I don't detect any decrease in the interest in protecting the environment. Nor is there any indication that government is prepared to slacken environmental controls.

In view of Hydro's surplus generating capacity, and the high cost of building new plants, would it not make sense to defer indefinitely construction of the Darlington nuclear generating station?

No. For a number of reasons. Despite the high capital cost, nuclear plants are the cheapest means of generating electricity that we can build today.

We have some coal plants that through the 1990s will be retired from service. Their capacity will have to be replaced. And there are no acid gas emissions from a nuclear plant. Even if you have fossil-fuel generation, it's preferable to run



Macaulay answers listeners' questions on an open line radio program.

ear plants. Finally, it's just not possible when you're building a reactor to change the size of Darlington to stop and start again. Our suppliers have committed themselves to major component production and the investment already made in plant, in employment and in materials is such that it's not economical to stop the project altogether. We're going to need Darlington and it's going to be economic to do so.

In 1990, more than half of Ontario's electricity will come from nuclear plants. At least one poll has indicated declining public support for nuclear power. Will it be difficult to increase electricity's share of the energy market without greater support for nuclear power?

Public attitudes are far more complex than what a few questions

in a poll can show. If you're trying to determine the level of public support for any form of energy, you've got to put that support in context with the alternatives.

If you want a useful measure of the level of support for nuclear-generated electricity, for example, you should be asking whether electricity consumers would be prepared to pay, say, 25 per cent more for their electricity if we switched from nuclear to coal, and whether they would accept more acid gas emissions. In my view, the people of Ontario don't think they pay too little for electricity now. If you and I had to rely on a lower proportion of nuclear power, the price of electricity in Ontario would go up.

Is Ontario Hydro too large to be effectively accountable to anyone but itself?

No, because it is an agency of government, and the mechanisms of control over its operations are very well developed.

Ontario Hydro is accountable to the elected representatives in the provincial legislature through the Ministry of Energy and is administered by a Board of Directors appointed by the Government of Ontario.

Every year we have to submit our rate proposals to the Minister of Energy, and then to explain them, and all of the cost components in them, at hearings conducted by the Ontario Energy Board. These are public hearings of an adversarial nature at which the public is free to intervene.

Virtually all of our major activities — borrowing, property purchases, all types of generation, routing of transmission lines, safety and labour relations practices — are subject to government regulation or approval. And many are open to direct public review.

What are the main challenges facing Ontario Hydro in the years ahead?

Right now, keeping the price of electricity down. Our challenge is the same one facing other industries — to produce a reliable and competitive product in a tough economy.

Taking a longer view, we have to be careful not to overreact to this economic slump. I don't think the people of Ontario would want Hydro to plan the utility system on the assumption that one-third of Ontario's industrial capacity will always be idle, as it was in 1982. They'll expect Hydro to be able to meet increased demand — at the right price — when the economy recovers. And Hydro will be ready.

Report from the President

•• Keeping electricity rates competitive over the longer term demands more than cost-cutting. ••



President Milan Nastich

For Ontario Hydro, it was a year of achievement in the midst of tough economic circumstances in both Ontario and Canada.

Despite the weak economic conditions that prevailed during the first five months of the year, use of electrical energy was close to what had been forecast. The particularly long, cold winter accounted for much of this electricity use which, in turn, masked the impact of poor economic conditions and the resulting industrial downturn.

At mid-year, however, as the weather became milder, the effect of the weak economy on Hydro's load pattern became much more evident. Growth in electricity use and, consequently, revenues began to fall off. At the time, it looked as though this downward trend — compounded by high inflation and interest rates — would continue through the year.

Hydro responded to these events quickly and decisively. An immediate effort was made to cut costs and reduce borrowings. All capital expenditures were stringently reviewed and operating budgets reduced.

As the year drew to an end, these efforts appeared to have paid off. Our revenue picture, although below what had been forecast, improved substantially during the latter months of the year. With the help of declining interest and inflation rates as well as a stronger Canadian dollar during the last two quarters, 1982 shaped up to be a successful year for Ontario Hydro —

particularly when compared with other utilities and industries.

But many of the economic pressures experienced in 1982 will continue during the coming year. These pressures, coupled with a firm commitment to maintaining our standards of quality and service, put a strain on Hydro's resources.

Higher costs usually mean higher rates. Yet we're also committed to providing electricity to the people of Ontario at the lowest cost possible. Over the past few years we have maintained an enviable record on electricity rates — since 1979, electricity rates have increased less than the rate of inflation — and our goal is no real increase in the price of electricity over the next decade.

Early in 1982, we applied to the Ontario Energy Board for an increase in electricity rates for 1983. After reviewing Hydro's submissions of unavoidable cost increases and its financial projections, the OEB recommended a reduced increase. Subsequently, the province announced an inflation restraint program for government and public sector agencies. As a consequence, Hydro's Board of Directors announced a rate increase of 8.4 cent for 1983.

The lower increase in electricity rates presented us with a challenge to maintain our financial health while cutting costs even further. Indeed, the major push to reduce costs across the board was a clear indication of Hydro's continued determination to become a trimmer, more cost-conscious organization.

But it was also clear that keeping electricity rates competitive over the longer term demanded more than cost-cutting.

Faced with this challenge, Hydro developed a new corporate strat-

the 1980s which took into account the economic environment in the coming decade. This strategy represents a shift in emphasis from employing new generation toward working with customers to determine how best to meet their energy needs. Hydro will be encouraging its customers to make better use of Ontario's electricity system wherever it is in their best interests to do so.

In every sense, this is complementary to the energy conservation message that Ontario Hydro, along with many other utilities, has been stressing for several years. Electricity should not be wasted. It should be used wisely. It should be used in more cases where it is an appropriate source of energy. More efficient use of Ontario's electricity supply system will reduce the cost to the other consumers of the province. Better and more efficient use of electricity can also play an important part in our national oil substitution effort.

Electricity exports will continue to play a major role. Since the mid-1970s Ontario Hydro's power exports to the United States have been a significant source of revenue. In 1982, exports brought in an income of \$163 million, which was tied directly to reducing the cost of power in Ontario. Last year we negotiated multi-year firm power sales to two American utilities and we intend to pursue more firm power exports in the future.

Another component of our strategy for the '80s is to seek out business opportunities related to electricity production such as the



Milan Nastich chats with Lakeview Generating Station control room staff.

sale of surplus steam, sale of radioisotopes or making available the expertise of Hydro staff. Here again the revenue earned will help keep the unit cost of electricity down — to the benefit of the people of Ontario. During 1982, for instance, the provincial government requested that Hydro assume control of the Bruce Energy Centre located near our Bruce Nuclear Power Development. This will allow us to market the surplus steam produced in the Bruce reactors to agricultural and industrial users in the area.

So the year 1982 marked a change in course for Ontario Hydro. The encroaching economic pressures of the past few years demanded firm action. We took firm action. The challenge that faced us in the past was to produce more and more power to meet rapidly growing demand for electricity. Today's challenge lies in successfully re-orienting Ontario Hydro to a pattern of slower growth while continuing to meet the energy

needs of the people it serves. And we will meet that challenge.

I want to pay special tribute to Hugh Macaulay, who has retired as Hydro's chairman after a term spanning the years 1979 to 1983. Hugh has guided us through a very challenging time, during which Hydro had to adjust to new circumstances. He achieved this by imparting to the organization his sense of the importance of keeping in close touch with our various publics. The people of Ontario have been well served by his leadership and foresight and the record will show that Hugh Macaulay's chairmanship was a period of great positive change for Ontario Hydro. We owe him an immense debt of gratitude.

Milan Nastich

Recession dampens energy demand

Reflecting the severity of the economic recession, primary electrical energy demand for the year failed to exceed that of the previous year for the first time since 1944. Actual demand reached 100.8 billion kilowatt-hours, 0.8 per cent below 1981.

On January 18, annual peak demand reached an all-time high of 18.1 million kilowatts, an increase of 5.4 per cent over the previous record set in January, 1981.

During the year, Ontario Hydro generated 104.1 billion kilowatt-hours of electricity, with almost equal contributions from the three primary sources — nuclear, coal and water power.

In addition, Hydro purchased 7.5 billion kilowatt-hours of electricity, 85 per cent of which was supplied by utilities outside the province, primarily in Manitoba and Quebec. Douglas Point Generating Station, owned by Atomic Energy of Canada Limited, provided the balance.

At year-end, in-service dependable peak capacity totalled 21.9 million kilowatts, down 3.6 per cent from the December, 1981, figure.

Performance record

During 1982, Ontario Hydro's nuclear generating units continued their outstanding performance. In September, Bruce Unit 3 completed a 494-day run at continuous full power, thereby setting a world record for continuous high operation. With a gross capacity factor of 96.8 per cent, this unit ranked first in world reactor performance for 1982.

In a world-wide comparison of reactors of 500,000 kilowatts or more, five of the eight Bruce and

Pickering units ranked within the top 10 performers in 1982. On a lifetime basis, Hydro units occupy seven of the top 10 places.

At the same time, the operating costs of nuclear generation continued to be considerably lower than those of fossil-fuelled generation for base load application.

Nuclear milestones

The year marked a milestone in the Candu program as Canada's first nuclear power station, the 20,000-kilowatt Nuclear Power Demonstration near Rolphton, celebrated 20 years of operation on October 1. Later that month Pickering B Unit 5 started up and produced its first electricity in December. Scheduled to go into service in July, 1983, this unit is the first of four at Pickering B which will provide almost 2.2 million kilowatts of additional nuclear capacity by 1985.

At Bruce A, an innovative method was used in October to repair Unit 3's fuel transfer system after irradiated fuel was damaged during transfer to the storage bay. A remote-controlled vehicle was used to remove the damaged fuel to a shielded flask. As a result, the job was completed in a short period of time and with low radiation exposure to staff.

Thunder Bay Unit 3 began commercial operation July 15, marking completion of the two-unit, 300,000-kilowatt extension to the single-unit station in service since 1963. Designed to burn low-sulphur western Canadian lignite, the new units are more efficient, cheaper to operate and environmentally more acceptable than the original unit.

Construction activities

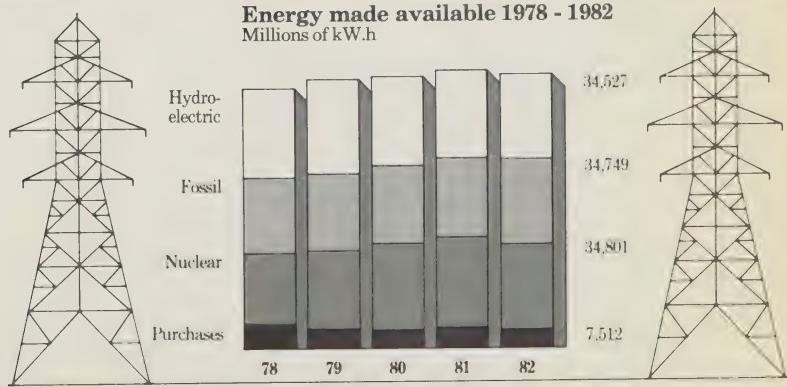
Hydro's generating station expansion program will add almost 9.2 million kilowatts of capacity to the Ontario power system by 1992.



Fuel is loaded into Unit 5 reactor at Pickering B. The unit started up in October and produced its first electricity in December.

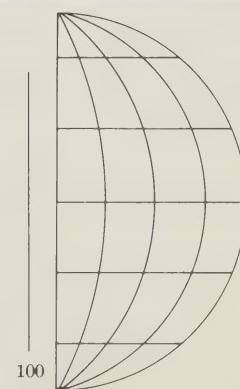
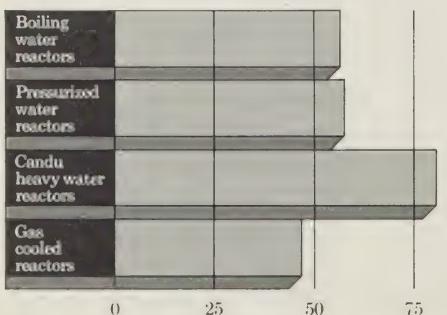


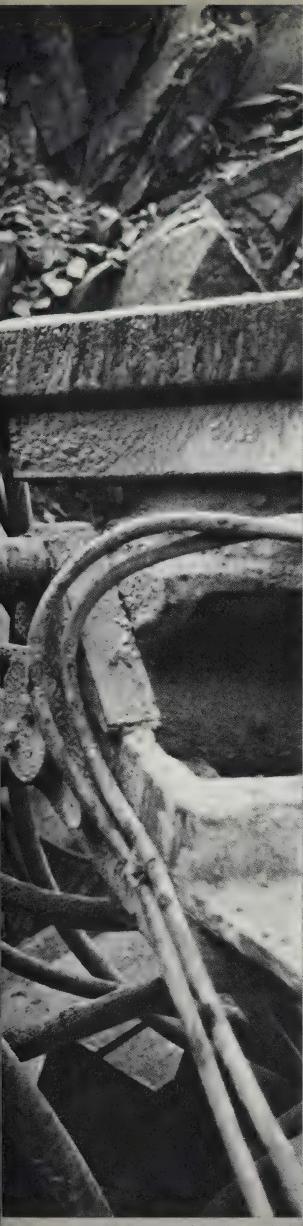
Energy made available 1978 - 1982
Millions of kW.h





World nuclear power reactor lifetime performance
Gross capacity factor (%)





Rock is excavated for the cooling water discharge at Atikokan GS. The will burn Canadian lignite and is completed in 1984.

Almost all of this capacity will be nuclear.

With major design work for Bruce B nuclear generating station essentially completed, construction progressed as scheduled during the year. The four units, with a combined capacity of 3.2 million kilowatts, are expected to come into service between 1984 and 1987. In addition, a low-level radioactive waste storage facility was completed and placed in service at the Bruce Nuclear Power Development.

By the end of 1982, Babcock and Wilcox (Canada) Limited had completed delivery of rebuilt steam generators for Pickering B. Meanwhile, design for Pickering A's emergency coolant injection system continued during the year, while an upgraded site security system was declared in service in March.

At Darlington, design and construction activity continued at a high level with 1,700 construction workers on site at year-end. When completed in 1992, the four-unit nuclear generating station will have a capacity of 3.6 million kilowatts.

At Atikokan, construction activities continued, reaching a peak during the year with a workforce of 1,200 on site. The single-unit station, designed to burn western Canadian lignite, is expected to be completed in 1984.

Transmission projects

Ensuring service reliability to customers remained a corporate priority as evidenced by the 268 transmission system construction and upgrading projects undertaken during the year. Notable among these was the reinforcing of the power supply to Prince Edward County. This project included the installation of a 230-kilovolt submarine cable, 1.6 km (one mile)

long — Hydro's first experience with underwater cable at this high voltage.

Design work and some construction have proceeded on the 345-kilovolt transmission line crossing of the Niagara Gorge at Sir Adam Beck Generating Station No. 2. This interconnection, scheduled for completion in 1984, will permit an increase in export sales to New York State.

In total, 172 km (107 miles) of new high voltage transmission lines as well as three new transformer stations at Picton, Nepean and Almonte were placed in service during 1982.

Construction cutbacks

Successive reductions in the long-range load forecast and the need to reduce costs prompted Board decisions during 1982 and early 1983 affecting construction of new power supply facilities.

In February, 1982, Hydro cancelled plans for one of the two units at Atikokan Generating Station in northwestern Ontario.

In November, based on a new load forecast of 2.1 per cent average annual growth in electricity use to the year 2000, down from the previous forecast of 3 per cent, in-service dates for the last two Darlington units were each put back two years. These changes in completion dates will reduce Hydro's borrowing requirements during the next few years.

Early in 1983, plans for a hydroelectric project on the Little Jackfish River, north of Lake Nipigon, were deferred indefinitely.

Cost-cutting reduces revenue shortfall

Late in October, Ontario Hydro announced rate increases averaging 8.4 per cent to take effect January 1, 1983. The 324 municipal utilities which purchase wholesale power from Ontario Hydro received an average increase of 8.2 per cent, while direct industrial and rural bills rose 8.5 per cent and 8.8 per cent respectively.

Originally Hydro had proposed a 13.9 per cent average increase for 1983. In August, following a public hearing, the Ontario Energy Board (OEB) recommended an increase of 8.8 per cent. The following month, the provincial government announced an inflation restraint program within government and public sector agencies. In keeping with both the OEB's recommendation and the aims of the province's restraint effort, Hydro's Board of Directors decided on an 8.4 per cent average increase.

Following its review of Hydro's 1983 rate submission, the OEB endorsed proposed changes to the costing and pricing of electricity, including the introduction in

January, 1983, of time-of-use rates for bulk power customers. However, after the OEB released its report, Ontario Hydro agreed to an Ontario government request that introduction of this pricing system be deferred to permit time to reconsider the economic impact on customers.

Restraint program

Faced with a decline in energy demand which reflected the severity of the recession during 1982, the Corporation underwent a year of review and cost-cutting as it strove to become a more efficient and responsive organization while maintaining its quality of service.

By mid-year, not only were revenues from primary and secondary sales down, but interest and foreign exchange costs were up well beyond expectations. By July, it appeared that the Corporation could experience a shortfall of \$120 million in net income from the forecast of \$386 million. However, by year-end the situation had improved considerably so that actual net income was \$348 million, \$38 million below forecast.

A stronger Canadian dollar and decreases in inflation and interest rates during the latter part of the year contributed to this improvement. Greater than expected output from hydro-electric generating stations helped as well by reducing the need for more costly generation.

However, another important factor affecting net income was the implementation at mid-year of an aggressive corporate restraint program.

A feature of this program has been a stringent review of all planned and existing capital construction projects to determine which could be rescheduled or scaled down to reduce revenue requirements. As a result of this review, a number of projects, primarily in the design and construction areas, were affected. A

major example was the rescheduling of two Darlington units in order to reduce borrowing requirements during the next few years.

In cooperation with staff, management took a hard look at operating, maintenance and administration (OM&A) costs and succeeded in considerably reducing these during the last few months of the year. As a first step, hiring restrictions were imposed, overtime and travel costs were restricted, and discussions were begun with representatives of management and professional staff which resulted in a voluntary compensation restraint program.

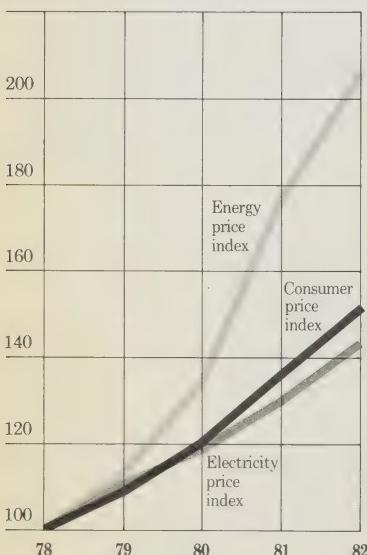
At the same time, it was decided to mothball the two remaining units at Lennox, Hydro's only oil-fired generating station.

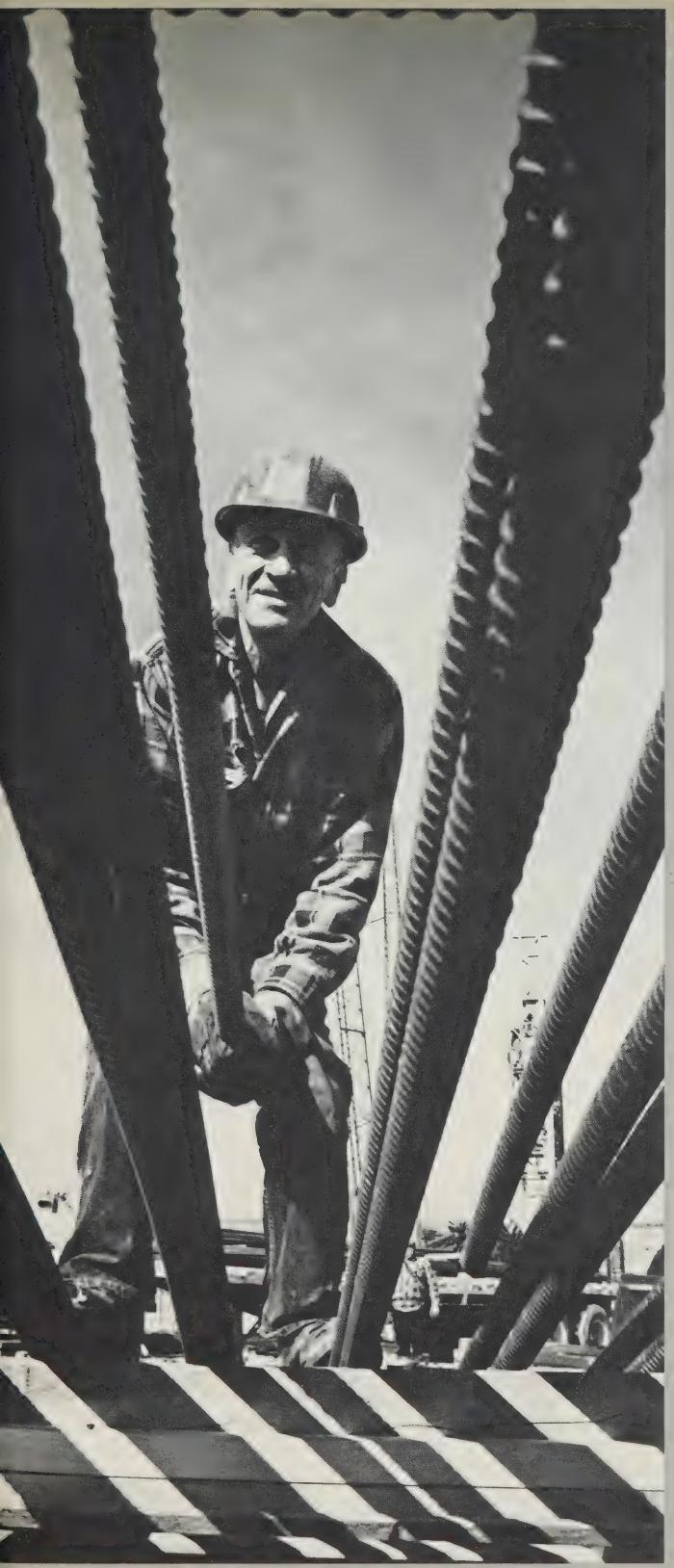
An inventory reduction program was developed to reduce carrying charges on coal, oil, heavy water, surplus real estate and standard materials. The program is expected to save the Corporation about \$10 million by the end of 1983. In total savings in excess of \$300 million could be achieved by the end of 1985.

The new year brought more cost-cutting decisions.

Addressing OM&A costs further, the Board of Directors decided in January to suspend the operation of Thunder Bay Generating Station Unit 1 and make supplemental staff from Thunder Bay available to commission Atikokan Generating Station. This reduction in additional commissioning staff requirements for Atikokan is

Price change comparison in Ontario (1978 = 100)





expected to save the Corporation \$1.6 million in 1983.

A decision was also made to close the Niagara Regional Office in Hamilton and redistribute the workload among other offices. This action is expected to save \$3.25 million a year. At the same time, the Corporation announced plans to mothball a sixth unit at the R.L. Hearn Generating Station in Toronto and reduce the operating hours of the two remaining units.

Purchases

Fuel purchases set record highs in 1982. Coal deliveries amounted to 13.4 million megagrams (14.7 million tons), an increase of 23 per cent over 1981. Nuclear fuel delivered to generating stations increased to 996 megagrams (1,096 tons), a 3 per cent change from the previous year.

Agreements were negotiated with Uranerz Exploration and Mining Limited and Eldorado Nuclear Limited for the supply of 5,200 megagrams (5,720 tons) of uranium concentrates during the period 1985-1993. These purchases will provide low-cost uranium as well as downward flexibility in the event of reductions in future requirements.

In addition, nuclear fuel manufacturing contracts were awarded to Westinghouse Canada Incorporated and Canadian General Electric Company Limited at lower prices than previously attained.

Payments for United States coal increased during the first half of 1982 as the value of the

Ironworker places reinforcing bars at Darlington GS construction site. In-service dates for the last two units have been deferred two years.



Export revenue moderates rates

Canadian dollar declined. However, year-end, the poor performance of the dollar was largely offset by success of cost-reduction efforts undertaken in cooperation with pliers. These savings amounted to more than \$40 million.

Two million barrels of surplus crude oil at Lennox Generating Station were marketed during the year, resulting in increased revenue as well as a reduction in borrowings. Excluding primary fuels, the total value of Hydro's awards for equipment, materials and services for 1982 was \$770 million, representing a decrease of \$144 million from 1981. Almost 76 per cent of the goods and services purchased by Ontario Hydro in 1982 came from Canadian sources. Ontario industries provided about 80 per cent of these Canadian purchases.

Over exports

Export sales of electricity to United States utilities, primarily in New York State and Michigan, amounted to 10.7 billion kilowatt-hours, 2.7 per cent less than the previous year. Income totalling \$163 million from these sales was used to reduce the overall cost of providing electricity to Ontario customers by 5.1 per cent in 1982.

Sales in 1982 were adversely affected by the unavailability of

some generation for export during the first quarter, transmission limitations and lower demand due to the economic recession and competition from other utilities. Revenues were also affected by lower than forecast export prices resulting from lower sales demand and lower world oil prices.

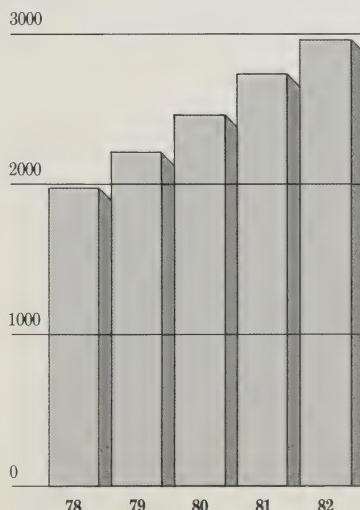
During 1982, one of Hydro's major export initiatives, a proposal to supply power to General Public Utilities (GPU) of New Jersey via a high voltage, direct current cable running under Lake Erie, was cancelled by GPU.

However, Hydro was successful in reaching an agreement to supply the Vermont Department of Public Service with up to 52,000 kilowatts of firm power annually for a five-year period which commenced in November.

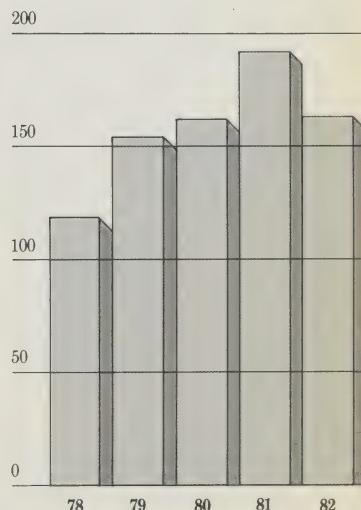
Under another agreement negotiated during the year, Hydro began supplying Niagara Mohawk in New York State with 400,000 kilowatts of firm power for four years effective in December. This sale is significant because the New York market is expected to become increasingly competitive when Hydro-Quebec completes its new interconnection with that state in 1984.

Hydro continued to pursue sales opportunities with other United States utilities with a view toward finding customers for eight to 12 billion kilowatt-hours of power a year, including at least one million kilowatts of firm power.

Revenue from sales of primary power and energy
\$ Millions



Income from export sales
\$ Millions



Construction is applied to Douglas Point tower dome against a backdrop of Bruce B construction (top).

Inside the Bruce B turbine hall, installation of a moisture separator after nears completion (left).

Advisory program assists residential customers

In keeping with the new corporate strategy, Hydro undertook a number of activities designed to provide a more effective response to customers' energy needs. Building from existing programs, Hydro intensified its work in the residential, industrial/commercial and agricultural sectors and began planning for a renewed marketing effort in 1983.

Demand management part of new strategy

Central to the new corporate strategy approved by the Board of Directors in October is a shift away from the supply of new generation toward a greater effort to work with customers to determine how Ontario's electricity resources can best be used to meet their energy needs.

One goal of the strategy is to help customers make more efficient and more extensive use of the existing electricity supply system in order to keep the unit cost of electricity down. This will make electricity a more attractive choice for new customers and for customers who want to move away from oil.

Hydro will be encouraging electricity use where it is in the best interests of customers, whether it be from the point of view of cost, convenience, reliability or a reduction in total energy use. And it will be exploring and developing new applications for electricity. At the same time, the Corporation will continue to encourage the wise use of all forms of energy.

Chief among the residential initiatives undertaken during the year was the further development of the Residential Energy Advisory Program (REAP). Hydro and 67 participating municipal utilities conducted almost 16,000 REAP surveys for homeowners wishing to improve the energy efficiency of their homes. Follow-up surveys indicated that about 13 per cent of the oil-heated homes first visited were fully converted to electric heating and an additional 2 per cent underwent partial electric conversions. By year-end, more than half of Ontario's residential electricity consumers had access to the program.

During the year, more than 20,000 residential customers in the province received Canada Oil Substitution Program grants to convert from oil to electric heating. Ontario Hydro is administering this federal program for electric conversions in Ontario. Additional annual electricity consumption resulting from these conversions is estimated at 280 million kilowatt-hours — about the amount of electricity used in one year by a city the size of Woodstock.

In the new home market, Ontario Hydro, in cooperation with the Canadian Electrical Association (CEA), continued its work with

builders across the province on a passive solar home program and prepared to introduce a new program fostering construction of "super energy-efficient" housing.

Another new program aimed initially at Hydro's rural residential customers was the third party notification program. Designed to assist customers who face collection action as a result of lost or forgotten electricity bills, it will be particularly useful to customers who are elderly, disabled or who have health or language difficulties.

In the industrial/commercial sector, Hydro conducted energy surveys in 78 shopping centres and more than 35 large industrial plants to help businesses and industries determine what possibilities exist for effective energy savings and oil substitution. One promising area is the development of plasma arc technology which could play a major role in oil substitution in industry. Hydro also continued to work with the CEA on developing standards of efficiency for electric motors for industrial and commercial applications.

During the year, load management field trials involving commercial and residential customers continued in Scarborough and Oshawa. These are designed to determine the technical and economic feasibility of shifting electrical loads from peak to off-peak times. Reliable end-use data are now being obtained and analysed from the 12 test homes and 21 commercial

Establishments in the Oshawa test program.

In addition, load management plant surveys were completed for customers in cement and glass manufacturing.

Several customer service programs focused on the agricultural sector. Farm commodity producer seminars led at greater energy efficiency were continued during the year. Depth energy surveys of 18 large farms were also completed. In addition, Hydro's field research program, which tests the energy efficiency of new agricultural equipment, undertook 12 new projects.

The problem of tingle or stray voltage, which can adversely affect productivity of livestock, was given a high priority during the year. In an effort to help the farming community, Hydro developed and tested prototype equipment for installation at an affected farm, trained staff and developed policies and procedures dealing with individual inquiries.



Electricity uses in agriculture were displayed and explained at a plowing and farm shows (top).

Nearly 16,000 Ontario homeowners learned how to improve the energy efficiency of their homes (right).

Efforts continue to protect environment

Hydro continued its work to minimize the social and environmental impact of its wide-ranging operations.

Efforts to reduce acid gas emissions included the installation of special low NO_x burners on one unit at the Nanticoke thermal generating station. These burners are designed to burn coal at a lower temperature, thereby reducing the quantity of nitrogen oxides produced. Test results on the first unit have exceeded design expectations, achieving an emissions reduction of about 40 per cent. As part of the Corporation's program to reduce acid gas emissions, the remaining seven Nanticoke boilers will also be converted.

Another measure undertaken to improve air quality was the installation of an opacity monitoring system to facilitate detection of unacceptable emissions from Lambton Generating Station.

Public involvement

Following public hearings during 1982 under the Consolidated Hearings Act (1981), the provincial government approved plans for extending the bulk power system in both eastern and southwestern Ontario. With these broad system plans now determined, the next step — identifying and getting approval for specific routes — has begun. When completed in the latter part of this decade, these major transmission projects will improve service reliability to consumers in the eastern and southwestern parts of the province. The southwestern transmission project will also ensure that all the electricity generated at the Bruce Nuclear Power Development can be delivered to the power system.

Extensive public involvement programs for the "route phase" of these transmission expansion studies began in the fall of 1982. These programs involve citizens, municipal and provincial

governments and agricultural, environmental and other interests in the identification and evaluation of alternative routes.

Assessing the effects of projects on people continued to be an important Hydro activity in 1982. Social impact assessments were carried out for projects in the planning stages, while regular social impact management and monitoring helped to mitigate the effects of Hydro's activities on Ontario communities.

About 40,000 people attended Hydro's electrical effects demonstrations held at various locations throughout the province during the year. These are designed to illustrate the effects of high voltage transmission lines on people, animals and farm equipment.

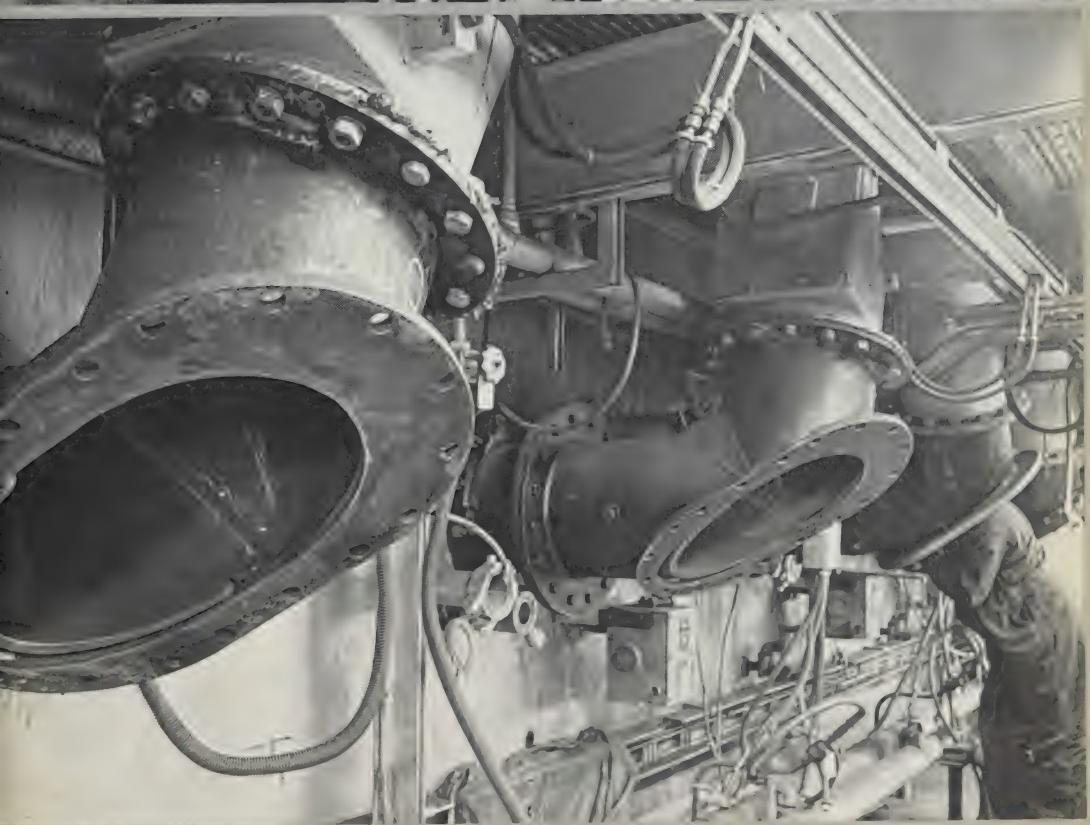
With a view to minimizing the amount of cultivated farmland taken out of production, preliminary designs for narrow base 230-kilovolt and 500-kilovolt towers were developed and discussed with the Ontario Federation of Agriculture.

Nuclear safety

In order to meet its public safety responsibilities with respect to nuclear power generation, Hydro is contributing to the development of methods for long-term radioactive waste storage and disposal. Conceptual design work for storage, transportation and disposal of all forms of radioactive waste materials was carried out during the year. In addition, examination of abnormal events at nuclear stations, studies of operating risks, and the establishment of engineering standards to ensure equipment operation consistent with public safety continued.

More than 1,700 staff, including this field technician, are at work on the Darlington GS site (top).

Modification of coal burners on one Nanticoke unit reduced the nitrogen oxides emitted by 40 per cent (right).



Employees respond to new priorities

Ontario Hydro continued to encourage employees' dedication, productivity and job satisfaction but with changed emphasis reflecting the need for restraint in a weakened economy and for the organization to adjust itself to a pattern of slower growth.

These pressures and the changing direction signaled by the new corporate strategy made it clear that the organization would have to be scaled down and that there would be a need to redeploy staff.

Employees responded well when asked to support cost-cutting measures aimed toward reducing the Corporation's projected shortfall in net revenue due primarily to inflation, high interest rates and a weak Canadian dollar.

A mid-year 4.4 per cent pay increase for 600 senior managers was cancelled, restrictions were placed on overtime and travel costs and staff numbers were frozen at mid-year levels throughout the Corporation except in the area of direct operation and maintenance of nuclear plants.

A major and welcome contribution toward reducing costs was made by more than 70 per cent of management and professional staff who voluntarily donated the equivalent of about one week's pay per person — either in unpaid work or reduced work time.

To absorb some of the expected surplus staff, Hydro's Board of Directors approved a policy which

provides a special allowance to encourage early retirement in 1983. The offer is open to staff age 55 or older with at least 15 years of service.

In keeping with the Corporation's philosophy of providing continuity of employment through sound human resource planning, Hydro is attempting to match the skills and resources that are surplus to the needs of one part of the Corporation with those required by another. This is being achieved through close monitoring of surplus positions and openings resulting from attrition. Retraining is available for staff with potential to meet the requirements of those job vacancies being filled.

As the organization cut back on current and future programs, it considered the effect of shrinking prospects for work and career opportunities on staff morale. During the year, the Chairman, President and other senior officers continued to hold question and answer sessions at locations throughout Hydro.

But while trimming human resource costs is a major consideration, the organization's philosophy is still to manage its employees in a fair, open and consistent manner — one which recognizes both the needs and mutual obligations of Hydro and its employees. Hydro maintained its commitment to job-related training and development for improving the capabilities of its staff with trades, technical and managerial training.

Under its Equal Opportunities Program, Hydro introduced a number of initiatives designed to ensure equal access to training and career advancement for all employees.

Hydro's policy against discriminatory activities, which reflects the requirements of the Ontario Human Rights Code, is part of this overall philosophy of fair and equal treatment. Because

of recent revisions to the Ontario Human Rights Code, Hydro's policies and procedures for administering the code have been modified, a corporate-wide training program has been initiated and human rights topics have been addressed in employee communications.

Hydro's 6,000 professional and lower-level management staff negotiated a 10 per cent salary increase with a 4.45 per cent additional increase at mid-year. In addition, the Corporation and the 17,000 member Ontario Hydro Employees Union agreed on a 12 per cent pay increase for the year beginning April 1. Two-year wage settlements were reached with Hydro's 6,500 construction workers. These followed the construction industry pattern of a 23.5 per cent average increase over the two-year term.

Later in the year, however, all pay increases for the following year were limited to 5 per cent in accordance with the provincial government's inflation restraint legislation.

Health and safety

During 1982, Hydro was heavily involved in health and safety programs. Performance with respect to the incidence of disabling injuries was good with a rate of 5 per million employee hours. However, the fatal accident rate continues to cause concern. In the year there were three occupational deaths, bringing the Corporation's 10-year average to 8.1 fatalities per 100 million employee hours.

Corporate programs have been initiated to achieve a major reduction in the fatal accident rate. Attention has been focused on the highest priority problems — electrical contact, falls, falling objects and transportation incidents. Efforts under way include pole climbing studies, wo

Pension information

Disclosure of The Pension and Insurance Fund financial statement in the Ontario Hydro Annual Report is being discontinued. Instead, a new Pension and Insurance Fund brochure containing the statement and additional information will be distributed to employees and pensioners.



on improved fall arresting systems, ergonomics of line work, driver competence and hazard analysis of high risk work such as structural steel erection.

As in the past, intensive system safety accident and incident analyses were carried out with the aim of correcting deficiencies.

A wide range of long-standing surveillance programs dealing with employee exposures to hazardous substances was continued and adjustments were made to reflect new designated substance regulations. A study was launched to identify possible hazards associated with the operation of video display terminals.

With regard to nuclear safety, employee exposures were maintained at a very low level and radioactive emissions generally remained at less than 1 per cent of the Atomic Energy Control Board's limits.

On a more personal level, Ontario Hydro is giving greater attention to employee lifestyles. For instance, it offers programs to help Hydro employees reduce smoking and improve their physical fitness — measures designed to benefit both employer and employee.

During the year, the President reinforced the Corporation's health and safety efforts by instituting a more effective President's Safety Award procedure, continuing his personal involvement in reviews of serious accidents and issuing a new Corporate policy for health and safety. This policy directs that all risks to the health and safety of employees and the public resulting from Hydro's operations be as low as reasonably achievable, taking both social and economic factors into account.

Safety efforts included making a film to show linemen correct use of fall arresting equipment (top).

Newly hired nuclear station staff receive "hands on" training before assignment to job locations (left).

Research provides answers

During the year, Hydro's research staff continued to apply their expertise to finding solutions to technical and environmental problems associated with development and operation of the power system. And development work related to electricity's potential role in future technologies reached into new areas.

Environmental protection continued to be a focus of activity in 1982. Acid rain research included study of the interactions of clouds and acidic pollutants, modelling of long-range atmospheric transport and development of an instrument assembly for measuring the deposition of acidic pollutants at ground level. Development of systems for excluding fish from generating station cooling water intakes continued. One such system, employing a rope net behavioral barrier, has been recommended for Bruce B. As well, tests of a slotted intake developed for Darlington promise good performance.

Continuing its participation in Atomic Energy of Canada Limited's radioactive waste management program, Hydro undertook design, welding, remote inspection and corrosion studies for containers to be used to isolate and protect irradiated fuel for transportation and underground storage.

Fusion project

The expertise which Ontario Hydro has developed in the handling of tritium and deuterium will be applied in the Canadian Fusion Fuels Technology Project, established in April, 1982 as a joint program by Hydro, the Ministry of Energy and the National Research Council of Canada. As project manager, Hydro is participating in the development of Canadian scientific and technological expertise in the areas of fusion fuel systems, materials technology, equipment development and health and environmental programs.

Hydro's participation in the project will permit access to international fusion work and provide business opportunities in related high technology fields for Canadian industry.

Utilization studies

In anticipation of a greater provincial reliance on electricity during the next decade, utilization studies continued for developing ways of reducing costs of electrical applications without sacrificing safety, performance or reliability. Work included development and assessment of dual-fuel heating systems and of air, water and earth source heat pumps.

Electrical testing and development work increased in line with the organization's increasing emphasis on assisting customers to make the most economic use of available electrical capacity. Projects under way during the year included distribution system automation, load management and data acquisition, and design development of overhead and underground lines.

Alternative energies

Research and development activities continued in a number of alternative energy areas including propane and electric vehicles, energy storage devices, coal liquefaction, ethanol, methane, wind, biomass, cogeneration, solar cells and solar water heaters.

In a joint venture with the National Research Council, Ontario Hydro is involved in a five-year evaluation program for photovoltaic systems. At Atikokan, a remote monitor continuously samples the air quality at Finlayson Lake and transmits the data to Atikokan Generating Station, 14 km (nine miles) away. The 300 watts of electricity required to operate this monitor is generated by a 37-square metre (44 square yard) photovoltaic array, the largest in Canada. Huge energy storage batteries carry the system through sunless periods.





Skills in wide demand

The expertise of Ontario Hydro staff continued to be in demand around the world.

Skills were supplied to a number of utilities and agencies in other countries. As well, a number of their staff, including 26 thermal power plant supervisors from Indonesia, came to study Hydro's operations. During the year, Hydro received about \$9 million in revenue from these activities.

In the fall of 1980, Hydro entered into an agreement with Atomic Energy of Canada Limited (AECL) to supervise the commissioning of a 600,000-kilowatt Candu station that AECL was building for the Korea Electric Power Corporation at Wolsung. A team of 35 Hydro employees is now finishing up this assignment and all but 11 will return home by the end of April, 1983. The remaining team members will act as consultants to Korean plant staff for 12 more months.

Since November, 1981, 13 Hydro people have been in Argentina performing commissioning duties on the 600,000-kilowatt Candu

reactor being built by the Comision National de Energia Atomica.

The Hydro staff are part of AECL's commissioning team and are responsible for the training of maintenance and operating staff there as well.

Nine Ontario Hydro staff are currently training hydro-electric operators and maintenance employees for the Volta River Authority (VRA) in Ghana. The project, funded through the Canadian International Development Agency (CIDA), also involves a data processing audit requested by VRA and the development of terms of reference for a management audit of the VRA.

Under two other CIDA projects, an eight-member Hydro team is training high voltage transmission maintenance staff for the Water and Power Development Authority of Pakistan, and a Hydro employee is advising the Kenyan government on rural electrification.

Hydro is considering collaboration with Canadian consulting engineering firms on a number of other specially funded transmission, distribution and training projects in foreign countries. As well, Hydro is working with Canadian firms interested in installing solar water heating systems in Kenya and Greece.

Gas chromatograph is used for hundreds of chemical analysis jobs like determining whether oils are free of PCBs and ready for disposal.

Ontario Hydro

Board of Directors

J. A. Gordon Bell, Thornhill
Deputy Chairman, President and
Chief Operating Officer, Bank of
Nova Scotia

Arthur J. Bowker, Ottawa
Research Officer, National
Research Council

Alan B. Cousins, Wallaceburg
President, Ideal Stampings Limited

John B. Cronyn, London
Director, John Labatt Limited

A. Ephraim Diamond, Toronto
President, Whitecastle Investments
Limited

John W. Erickson, q.c., Thunder
Bay
Barrister and Solicitor, McKitrick,
Erickson, Jones, Shanks

Isobel Harper, Toronto
President, BDI Enterprises Ltd.

Albert G. Hearn, Agincourt
Former Vice-President, Service
Employees International Union

Hugh L. Macaulay, Toronto
Chairman, Ontario Hydro

Milan Nastich, Toronto
President, Ontario Hydro

O. John C. Runnalls, Toronto
Professor, Energy Studies,
University of Toronto

Leonard N. Savoie, Sault Ste.
Marie
President and Chief Executive
Officer, Algoma Central Railway

William A. Stewart, London
Former Minister of Agriculture and
Food for Ontario

Officers

Chairman of the Board
Hugh L. Macaulay

Vice-Chairman
Arthur J. Bowker

President
Milan Nastich

Executive Vice-Presidents
Patrick G. Campbell
Operations

Arvo Niitenberg
Planning & Administration

Vice-Presidents
E. H. (Ted) Burdette
Finance

L. A. (Vern) Coles
Distribution & Marketing

Frank W. Gomer
Human Resources

Sam G. Horton
Design & Construction

H. Allen Jackson
Production & Transmission

John G. Matthew
Power System Program

Dane B. MacCarthy
Corporate Relations

Lorne G. McConnell
Supply & Services

Secretary and General Counsel
William E. Raney, Q.C.

Treasurer
Dirk Peper

Corporate Comptroller
Ron W. Bartholomew

Regional Directors

Central Region
H. K. (Hal) Wright
5760 Yonge Street
Willowdale M2M 3T7

Eastern Region
P. J. (Phil) Garlough
420 Dundas St. East
Belleville K8N 5C3

Georgian Bay Region
F. A. (Al) Perttula
93 Bell Farm Road
Barrie L4M 1H1

Niagara Region
J. W. H. (Bill) Kerr
Box 157, 1053 Main St. West
Hamilton L8N 3B9

Northeastern Region
C. G. (Gord) Sanford
590 Graham Drive
North Bay P1B 8L4

Northwestern Region
J. D. (Jack) Hamer
34 Cumberland St. North
Thunder Bay P7A 4L5

Western Region
Dr. David A. Drinkwater
1075 Wellington Road
London N6E 1M1

Committees of the Board of Directors

Finance
H. L. Macaulay (*Chairman*)
J. A. G. Bell
A. J. Bowker
A. E. Diamond
M. Nastich
L. N. Savoie

Audit
A. E. Diamond (*Chairman*)
A. J. Bowker
A. B. Cousins
J. B. Cronyn
I. Harper
A. G. Hearn
H. L. Macaulay

Management Resources
J. A. G. Bell (*Chairman*)
A. J. Bowker
J. B. Cronyn
H. L. Macaulay
O. J. C. Runnalls
L. N. Savoie
W. A. Stewart

Social Responsibility
A. J. Bowker (*Chairman*)
A. B. Cousins
J. W. Erickson
I. Harper
A. G. Hearn
H. L. Macaulay
W. A. Stewart

Technical Advisory
O. J. C. Runnalls (*Chairman*)
A. J. Bowker
J. W. Erickson
H. L. Macaulay
M. Nastich

(As at December 31, 1982)

Financial Review

Ontario Hydro's revenues in 1982 totalled \$3,388 million. Primary sales of electricity to customers in Ontario amounted to \$2,969 million, while secondary sales mainly to United States utilities totalled \$419 million in 1982. Primary revenues increased 5% or \$232 million over 1981 due to a 3% increase in power rates, partially offset by a 1.1% decrease in volume of sales. Secondary revenues decreased \$6 million largely due to lower demand for export electricity and transmission sales with United States utilities. The income from these export sales reduced the costs to customers in Ontario by approximately \$163 million or 5.1%. The average increase in the cost of electricity to customers in Ontario during 1982 was below the 1982 inflation rate. The average increase in rates for municipal utilities was 9.6%, while the average increases for direct industrial customers and rural retail customers were 10.0% and 8.7%, respectively. Under an amendment to the Power Corporation Act, commencing in 1982, Ontario Hydro reduced the differential between rural retail and municipal utility residential rates to 15 percent. In 1982, discounts amounting to \$33 million were provided to rural residential customers and recovered from primary customers supplied with electricity by Ontario Hydro. The volume of primary energy sales in 1982 was lower than in 1981. The 1982 sales to municipal utilities and rural retail customers increased 0.8% over 1981. This increase was more than offset by a 11.5% decline in 1982 sales to direct industrial customers reflecting the economic downturn in 1982.

Ontario Hydro's total operating costs in 1982 amounted to \$3,039 million compared to \$2,755 million in 1981, an increase of 10.3%. Costs increased largely as a consequence of escalating prices for fossil fuels, continuing inflationary

pressure on the costs of labour, materials and purchased services.

Energy related costs including fuel and purchased power increased 14.5% over 1981. Electric energy generated by nuclear stations supplied 31% of total energy to the system in 1982, while hydraulic stations and fossil-fueled generation each provided another 31%. The balance of energy available was provided by purchases of power from interconnected utilities. The cost of fuel used for electric generation from all sources totalled \$902 million in 1982, an increase of \$136 million over 1981. This increase was largely because of the higher cost of fossil-fueled generation and the inclusion of a provision of \$56 million for irradiated nuclear fuel disposal costs commencing in 1982.

Purchases of power in 1982 amounted to \$128 million, the same as in 1981. Payments to Atomic Energy of Canada Limited and the Province of Ontario, as required under the nuclear payback agreement, totalled \$65 million in 1982, an increase of \$2 million over 1981. These payments were made in proportion to the capital contributions of these parties to the construction of the Pickering Nuclear Generating Station units 1 and 2, and reflect the continuing advantage of nuclear over coal-fired generation.

During 1982, costs associated with the operation, maintenance and administration of Ontario Hydro's in-service facilities amounted to \$854 million. The increase of \$89 million over 1981 was primarily the result of escalation in labour and other costs, and increases in the cost of operating and maintaining new generation and transmission facilities.

Depreciation costs charged to operations totalled \$348 million in

1982, an increase of \$23 million or 7.1% over 1981. The primary factor contributing to this increase was additional facilities being placed in service, including Thunder Bay GS unit 3 and expanded transmission facilities. In addition, commencing in 1982, depreciation costs for the year included a provision of \$14 million for decommissioning of nuclear generating facilities. These increases were partially offset by the impact of extensions in the service lives implemented in 1982 for these facilities.

Interest and foreign exchange costs charged to operations totalled \$743 million in 1982, \$34 million or 4.8% higher than 1981. These higher financing costs resulted from a \$15 million increase in interest costs charged to operations and a \$19 million increase in foreign exchange costs during the year. The increase in interest costs charged to operations reflected the net impact of a \$338 million increase as a result of borrowings during 1982 for the capital construction and heavy water production programs, offset by a \$323 million increase in interest capitalized as a cost of constructing new facilities and producing heavy water. The increase in foreign exchange costs reflected the higher level of the Corporation's foreign debt repayable within one year.

Net income for 1982 was \$348 million, \$58 million lower than in 1981. As required by the Power Corporation Act, \$168 million of net income was appropriated for debt retirement purposes in 1982. The remaining \$180 million balance of 1982 net income was appropriated to the Reserve for the Stabilization of Rates and Contingencies. The resulting interest coverage and debt ratio indicators of Ontario Hydro's financial soundness are:

Financial indicators	1982	1981
Interest coverage	1.20	1.30
Debt ratio	.845	.841

The funds required by Ontario Hydro to finance the construction

of fixed assets were provided from two major sources, operations and debt financing. In 1982, funds from operations provided \$781 million of Hydro's total requirements, while \$2,214 million was provided by debt financing. Compared to 1981, these amounts were \$30 million and \$498 million higher, respectively.

Bonds, notes and other long-term debt issued by Ontario Hydro during 1982 totalled \$2,845 million. Canadian bonds of \$1,120 million were sold during 1982. In addition, United States bond issues of U.S. \$700 million (Cdn. \$861 million) and Eurodollar bond issues of U.S. \$700 million (Cdn. \$863 million) were issued. The average coupon interest rate for bonds issued in 1982 was 14.6% compared to 15.2% in 1981. Maturing long-term debt

amounted to \$403 million in 1982 compared to \$345 million in 1981. In addition, during 1982, a net amount of \$228 million of debt was redeemed as part of Hydro's program to support the secondary market for its securities. This compares to net redemptions of \$185 million in 1981.

Net additions to fixed assets were \$2,883 million during 1982. Major capital expenditures were \$2,487 million for generation facilities including \$359 million for heavy water, \$291 million for transmission and distribution facilities, and \$105 million for administration and service facilities. Net additions were \$739 million higher than those in 1981, mainly the result of increased expenditures of \$756 million on generation facilities, offset by

decreased expenditures of \$53 million on heavy water production facilities. The expenditures on major generation projects under construction during 1982 and 1983 were:

	1982	1983
	Expenditure \$ millions	
Nuclear generation		
Bruce "B"	850	600
Pickering "B"	467	350
Darlington	381	100
Fossil generation		
Atikokan	178	
Thunder Bay	29	

During 1982, the final coal-fired unit at the Thunder Bay Generating Station was placed in service at a cost of \$180 million.

Source of revenues in 1982

Total revenues \$3,387,630,000

Municipal utilities

59.0%

Rural retail customers

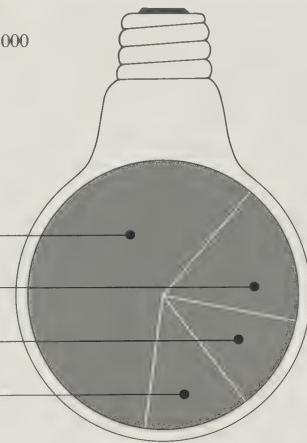
17.0%

Direct industrial customers

11.7%

Secondary power and energy

12.3%



Application of revenues in 1982

Total revenues \$3,387,630,000

Operation, maintenance and administration

25.2%

Fuel used for electric generation

26.6%

Financing charges

21.9%

Depreciation

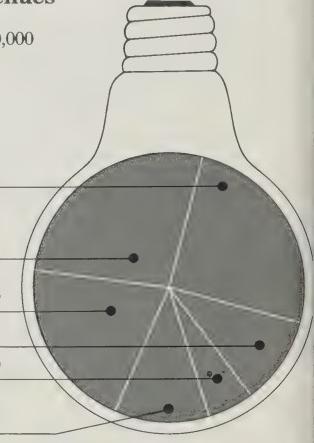
10.3%

Other

5.7%

Net income appropriations

10.3%



Long-term debt issued

\$ millions

Canadian issues

3000

Canada Pension Plan funds

2500

U.S. issues

2000

Eurodollar issues

1500

Other long-term debt

1000

0



Net additions to fixed assets

\$ millions

Generating stations

3000

Transmission and distribution facilities

2500

Heavy water production facilities

2000

Administration and service facilities

1500



Summary of Significant Accounting Policies

accompanying financial statements have been prepared by management in accordance with generally accepted accounting principles in Canada which, except for the change in accounting policy described under "Fixed assets", have been applied on a basis consistent with that of the preceding year. In management's opinion, the financial statements have been properly prepared within reasonable limits of materiality and in the light of information available up to March 1983. To assist the reader in understanding the financial statements, the Corporation's significant accounting policies are summarized below:

Rate-setting

Ontario Hydro has broad powers to generate, supply and deliver electricity throughout the Province of Ontario. The Corporation operates under the Power Corporation Act and is subject to provisions of the Ontario Energy Board Act. Under the provisions of the Power Corporation Act, the price payable by customers for power is the cost of supplying the power. Such cost is defined in the Act to include the cost of operating and maintaining the system, depreciation, interest, and the amounts appropriated for debt repayment and stabilization of rates and contingencies. The debt repayment appropriation is the amount required under the Act to accumulate in 40 years a sum equal to the debt incurred for the cost of fixed assets in service. The appropriation for, or withdrawal from, the stabilization of rates and contingencies reserve is an amount established to maintain a sound financial position and to stabilize the effect of cost fluctuations. Under the provisions of the Ontario Energy Board Act, a public hearing before the Ontario Energy Board is required in respect of any changes in electricity rates proposed by Ontario Hydro which affect its municipal utilities, direct industrial customers, or, if the Minister of Energy so directs, rural utility customers. The Ontario Energy Board submits its

recommendations to the Minister of Energy. After considering the recommendations of the Ontario Energy Board, the Board of Directors of Ontario Hydro under the authority of the Power Corporation Act establishes the electricity rates to be charged to customers. If the Board of Directors specifies a certain cost or gain is to be included in future electricity rates, that would otherwise be charged or credited to operations in the current year, then this cost or gain is deferred and amortized to future operations on a basis consistent with its inclusion in rates.

Fixed assets

Fixed assets are capitalized at cost which is comprised of material, labour and engineering costs, plus overheads, depreciation on service equipment and interest applicable to capital construction activities. In the case of generation facilities, cost also includes the net cost of commissioning, and for nuclear generation, the cost of heavy water. The net cost of commissioning is the cost of start-up less the value attributed to energy produced by generating units during their commissioning period. The cost of heavy water is the direct cost of production and applicable overheads, plus interest and depreciation on the heavy water production facilities. Leases which transfer the benefits and risks of ownership of assets to Ontario Hydro are capitalized.

Interest is capitalized on construction in progress at rates (1982 - 13.9% and 1981 - 11.5%) which approximate the average cost of long-term funds borrowed in the years in which expenditures have been made for fixed assets under construction. If the construction period of a project is extended and the construction activities are continued, interest is capitalized during the period of extension provided that the project has a reasonable expectation of completion. Prior to January 1, 1982, if it was decided to significantly extend the construction period of a project,

interest was not capitalized on construction during the period of extension. This change has been applied on a prospective basis because of the nature of the environment in which Ontario Hydro establishes its electricity rates. The effect of this change on net income for the year ended December 31, 1982 is insignificant.

If a project is deferred and construction activities are halted, interest is not capitalized during the period of deferral. If a project is cancelled, or deferred indefinitely with a low probability of construction being resumed in the future, all costs, including the costs of cancellation, are written off to operations unless, in accordance with its rate-setting authority, the Board of Directors of Ontario Hydro specifies such costs be amortized as a cost of operations in future years for recovery through future electricity rates. If fixed assets are mothballed for future use, the associated mothballing costs are charged to operations.

Depreciation

Fixed assets in service are depreciated on a straight-line basis. Depreciation rates for the various classes of assets are based on their estimated service lives, which are subject to periodic review. Changes in service life estimates are implemented on a remaining service life basis from the year the change is reflected in electricity rates. The estimated service lives of assets in the major classes are:

Generation

hydraulic - 65 to 100 yrs.
fossil - 25 to 35 yrs. (1981-30 yrs.)
nuclear - 40 yrs. (1981-30 yrs.)

Heavy water - over the period ending in the year 2040 (1981-2030)

Transmission and distribution - 20 to 55 yrs.

Administration and service - 5 to 60 yrs.

Heavy water production facilities - 11 to 20 yrs. (1981-20 yrs.)

Summary of significant accounting policies continued

In accordance with group depreciation practices, for normal retirements the cost of fixed assets retired is charged to accumulated depreciation with no gain or loss being reflected in operations. However, gains and losses on sales of fixed assets, and losses on premature retirements are charged to operations in the year incurred as adjustments to depreciation expense.

When the costs of removal less proceeds on retirement of fixed assets can be reasonably estimated and are significant, the amounts are charged to operations over the remaining service life of the fixed assets; otherwise the amounts are charged to operations in the year incurred as adjustments to depreciation expense. As a result of studies on the estimated costs of removal and expected proceeds on retirement of nuclear generating stations, commencing January 1, 1982, the estimated costs of decommissioning nuclear stations are charged to operations over their remaining service lives on an annuity basis. Changes in these estimated costs arising from periodic reviews are implemented on the remaining service life basis from the year the changes are reflected in electricity rates.

Fixed assets removed from service and mothballed for future use are amortized so that any estimated loss in value is charged to operations on a straight-line basis over their expected non-operating period.

Deferred construction projects are amortized so that any estimated loss in value is charged to operations on a straight-line basis over their expected deferral period. On disposal of component parts during the deferral period, the cost of fixed assets less proceeds on disposal are normally charged to accumulated amortization with no gain or loss being reflected in operations.

Unamortized advances for fuel supplies

As part of its program to ensure the adequate supply of fuels for its generating stations, Ontario Hydro has entered into long-term fuel

supply contracts. Where these contracts require Ontario Hydro to make payments for pre-production costs to suppliers in advance of product delivery, these payments and associated costs, including interest, are carried in the accounts as unamortized advances for fuel supplies. The advances are amortized to fuel inventory as the fuels are delivered.

Fuel for electric generation

Fuel used for electric generation is comprised of the average inventory costs of fuel consumed, charges for commissioning energy produced, and provisions for disposal of nuclear fuel irradiated during the period. The inventory cost of fuel consumed is comprised of fuel purchases, transportation and handling costs, and the amortization of advances for fuel supplies. Transportation costs include charges for interest and depreciation on railway equipment owned by Ontario Hydro. The charges for commissioning energy produced during the period represent the incremental operating and fuel costs of producing the same quantity of energy at generating units displaced because of the commissioning activity. As a result of studies on the estimated costs of disposal of irradiated nuclear fuel, commencing January 1, 1982, the estimated costs for disposal of nuclear fuel irradiated in each period are charged to operations on an annuity basis. The estimated costs for disposal of fuel irradiated prior to January 1, 1982, are amortized to operations on an annuity basis over a ten year period. Changes in estimated costs resulting from periodic reviews are implemented from the year the changes are reflected in electricity rates.

Unamortized debt discount

Debt discounts or premiums arising on the issuance of debt are amortized over the period to maturity of the debt. In addition, redemption discounts or premiums on debt acquired prior to the date of maturity are amortized over the period from the acquisition date to the original maturity date of the debt.

Nuclear agreement – Pickering units 1 and 2

Ontario Hydro, Atomic Energy of Canada Limited and the Province of Ontario are parties to a joint undertaking for the construction and operation of units 1 and 2 of Pickering Nuclear Generating Station, with ownership of these units being vested in Ontario Hydro. Contributions to the capital cost by Atomic Energy of Canada Limited and the Province of Ontario amounted to \$258 million and these have been deducted in arriving at the value of fixed assets in service in respect of Pickering units 1 and 2. Ontario Hydro is required to make monthly payments until the year 2001 to each of the parties in proportion to their capital contributions. These payments, termed "payback", represent in a broad sense the net operational advantage of having the power generated by Pickering units 1 and 2 as compared with coal-fired units similar to Lambton units 1 and 2.

Foreign currency translation
Long-term debt payable in foreign currencies is translated to Canadian currency at rates of exchange at the time of issue. Current monetary assets and liabilities, including long-term debt payable within one year, are translated to Canadian currency at year-end rates of exchange and the resulting gains or losses, together with realized exchange gains or losses, are credited or charged to operations.

Pension plan

The pension plan is a contributory defined benefit plan covering all regular employees of Ontario Hydro. The pension costs, as actuarially determined, include current service costs and amounts required to amortize any surpluses or unfunded liabilities. Pension plan surpluses and unfunded liabilities are amortized over a fifteen year period.

Research and development

Research and development costs are charged to operations in the year incurred, except for those related directly to the design or construct of a specific capital facility.

Statement of Operations

the year ended December 31, 1982

	1982	1981
	\$'000	\$'000
venues		
Primary power and energy (note 1)		
Municipal utilities	1,997,752	1,800,129
Rural retail customers	575,784	545,760
Direct industrial customers	395,250	391,038
	2,968,786	2,736,927
Secondary power and energy (note 2)	418,844	424,581
	3,387,630	3,161,508
expenses		
Operation, maintenance and administration	853,569	764,712
Oil used for electric generation	902,089	765,429
Power purchased	127,519	127,919
Clear agreement — payback	65,334	62,801
Depreciation (note 3)	347,779	324,596
	2,296,290	2,045,457
income before financing charges	1,091,340	1,116,051
Interest (note 4)	672,503	657,490
Gain exchange (note 5)	70,418	51,743
	742,921	709,233
income	348,419	406,818
appropriation for:		
Retirement as required by the Power Corporation Act	168,015	152,766
Stabilization of rates and contingencies	180,404	254,052
	348,419	406,818

accompanying summary of significant accounting policies and notes to financial statements.

Statement of Financial Position

as at December 31, 1982

Assets	1982	1
	\$'000	\$
Fixed assets		
Fixed assets in service (note 6)	13,073,735	12,489,
Less accumulated depreciation	3,186,729	2,787,
	9,887,006	9,702,
Construction in progress (note 6)	7,712,599	5,381,
Deferred construction projects (note 10)	—	364,
	17,599,605	15,447,
Current assets		
Cash and short-term investments (note 7)	452,200	408,
Accounts receivable	364,277	373,
Fuel for electric generation (note 8)	801,842	681,
Materials and supplies, at cost	199,489	157,
	1,817,808	1,620,
Other assets		
Unamortized advances for fuel supplies (note 9)	758,823	596,
Unamortized deferred costs (note 10)	394,793	373,
Unamortized debt discount	58,893	72,
Long-term accounts receivable and other assets	90,910	91,
	1,303,419	1,761,
	20,720,832	17,829,

See accompanying summary of significant accounting policies and notes to financial statements.

liabilities	1982 \$'000	1981 \$'000
ng-term debt		
bonds and notes payable (note 11)	16,089,328	13,840,051
Other long-term debt (note 12)	241,159	260,300
	16,330,487	14,100,351
es payable within one year	448,537	437,769
	15,881,950	13,662,582
urrent liabilities		
Counts payable and accrued charges	562,223	475,292
hort-term notes payable	112,949	97,200
Accrued interest	521,094	400,639
ng-term debt payable within one year	448,537	437,769
	1,644,803	1,410,900
Other liabilities		
ng-term accounts payable and accrued charges	80,753	66,486
Accrued irradiated fuel disposal and plant decommissioning costs (note 13)	75,644	—
	156,397	66,486
ntingencies (notes 6 and 14)		
uity		
Liabilities accumulated through debt retirement appropriations	1,971,458	1,803,662
Reserve for stabilization of rates and contingencies	939,529	759,296
Distributions from the Province of Ontario as assistance for rural construction	126,695	126,695
	3,037,682	2,689,653
	20,720,832	17,829,621

behalf of the Board



irman

President

Toronto, Canada,
March 14, 1983.

Statement of Equities Accumulated through Debt Retirement Appropriations

for the year ended December 31, 1982

	Municipal Utilities	Power District (Rural Retail and Direct Industrial Customers)	1982	Totals
	\$'000	\$'000	\$'000	\$'
Balances at beginning of year	1,265,705	537,957	1,803,662	1,651,
Debt retirement appropriation	114,501	53,514	168,015	152,
Transfers and refunds on annexations by municipal utilities	1,367	(1,586)	(219)	(1,
Balances at end of year	1,381,573	589,885	1,971,458	1,803,

Statement of Reserve for Stabilization of Rates and Contingencies

for the year ended December 31, 1982

	Held for the benefit of all customers	Held for the benefit of (or recoverable from) certain groups of customers			Totals	
	Municipal Utilities	Rural Customers	Industrial Customers	1982	1	
	\$'000	\$'000	\$'000	\$'000	\$'000	\$'
Balances at beginning of year	761,463	1,144	(1,375)	(1,936)	759,296	505,
Appropriation	186,709	127	(8,191)	1,759	180,404	254,
Transfers and recoveries on annexations by municipal utilities	(45)	—	1	—	(44)	(4)
Payment to Ontario Municipal Electric Association (note 15)	—	(127)	—	—	(127)	(1)
Balances at end of year	948,127	1,144	(9,565)	(177)	939,529	759,

See accompanying summary of significant accounting policies and notes to financial statements.

Statement of Changes in Financial Position

the year ended December 31, 1982

	1982	1981
	\$'000	\$'000
Source of Funds		
Net earnings	348,419	406,818
Charges not requiring funds in the current year:		
Depreciation	347,779	324,596
Provision for irradiated fuel disposal costs	56,708	—
Other	28,225	19,605
	781,131	751,019
Financing		
Long-term debt:		
Bonds and notes payable and other long-term debt issued	2,845,624	2,246,160
Less retirements	631,490	529,956
	2,214,134	1,716,204
Short-term notes payable — increase (decrease)	15,749	(47,325)
Cash and short-term investments — (increase)	(43,759)	(169,323)
	2,186,124	1,499,556
Counts payable and accrued interest — increase	207,386	136,752
Long-term accounts payable and accrued charges — increase	14,267	16,824
Counts receivable and other assets — decrease (increase)	16,333	(3,188)
	3,205,241	2,400,963
Application of funds		
Additions to fixed assets (note 16)	2,883,039	2,144,210
Mortized advances for fuel supplies — increase	161,999	182,719
Materials and supplies — increase	160,203	74,034
	3,205,241	2,400,963

accompanying summary of significant accounting policies and notes to financial statements.

Notes to Financial Statements

1. Primary power and energy

Under an amendment to the Power Corporation Act, commencing in 1982, Ontario Hydro is required to reduce the expected differential in each year between rural retail and municipal utility residential rates to 15 per cent. In 1981 discounts amounting to \$33 million were provided to rural residential customers and recovered from primary customers. In 1981, discounts amounting to \$20 million were recovered from the Province of Ontario and included rural retail revenues.

2. Secondary power and energy

Secondary power and energy is comprised mainly of revenues of \$418 million in 1982 (1981 - \$423 million) from sales of electricity to United States utilities.

3. Depreciation

	1982	1
	\$'000	\$'
Depreciation of fixed assets in service	452,189	382,
Amortization of deferred construction projects	15,508	16,
Provision for plant decommissioning costs	14,000	14,
Costs of removal less salvage proceeds on retirements	7,508	4,
	489,205	402,
Less:		
Depreciation charged to — heavy water production	108,754	50,
— construction in progress	23,733	21,
— fuel for electric generation	2,387	2,
Net gains on sales of fixed assets	6,552	4,
	141,426	78,
	347,779	324,

Depreciation of fixed assets in service includes \$15 million (1981 - \$13 million) for the amortization of non-operating generating units which have been mothballed. (See note 6.)

4. Interest

	1982	1
	\$'000	\$'
Interest on bonds, notes, and other debt	1,702,607	1,369
Interest on accrued irradiated fuel disposal and plant decommissioning costs	4,936	
	1,707,543	1,369
Less:		
Interest charged to — construction in progress	758,622	472
— heavy water production	127,042	96
— unamortized advances for fuel supplies	53,792	43
— fuel for electric generation	28,116	15
Interest earned on investments	67,468	84
	1,035,040	712
	672,503	657

5. Foreign exchange

	1982	1
	\$'000	\$'
Exchange loss on redemption and translation of foreign long-term debt	66,317	40
Net exchange loss on other foreign transactions	4,101	11
	70,418	51

ixed assets	1982			1981		
	Assets in Service	Accumulated Depreciation	Construction in Progress	Assets in Service	Accumulated Depreciation	Construction in Progress
eration – hydraulic	1,755,915	452,953	26,404	1,747,545	421,769	8,454
– fossil	2,797,302	804,473	392,697	2,579,429	717,339	407,132
– nuclear	1,950,220	366,665	5,878,047	1,902,932	309,839	4,059,144
ly water	594,007	85,984	1,028,890	590,670	77,264	564,022
mission and distribution	3,953,425	932,118	297,825	3,680,004	852,513	302,254
nistration and service	667,011	268,271	65,384	602,988	234,781	40,259
ly water production facilities	1,355,855	276,265	23,352	1,386,091	173,895	—
	13,073,735	3,186,729	7,712,599	12,489,659	2,787,400	5,381,265

units at the R. L. Hearn Generating Station and four units (1981 – two units) at the Lennox Generating Station are mothballed. The capital cost and accumulated depreciation of these non-operating units, amounting to \$2 million and \$162 million, respectively (1981 – \$268 million and \$89 million, respectively), are included in fossil generation assets in service. At this time it is uncertain if, or when, these units will resume operation.

struction in progress at December 31, 1982 is comprised of:

	Remaining Number of Units Scheduled	Planned In-Service Dates	Dependable Capacity to be Placed in Service	Costs Incurred to December 31, 1982	Estimated Costs to Complete (Excluding Escalation and Interest)
	MW	\$ millions	\$ millions		
Clear generating stations (including heavy water)					
Pickering "B"	4	1983-85	2,064	2,812	330
Bruce "B"	4	1984-87	3,000	3,045	1,200
Darlington	4	1988-92	3,524	771	4,120
Oil generating station					
Atikokan	1	1984	206	361	170
Other construction in progress	—	—	—	724	—
				7,713	

The above estimates are the most recent forecasts as of March 14, 1983. These estimates exclude cost escalation and rest which are forecast to average 10.0% and 14.2% per year, respectively, over the period 1983 to 1992. Because the uncertainties associated with long construction lead times and planned in-service dates, these costs to complete are subject to change.

	1982	1981
	\$'000	\$'000
Bank and interest bearing deposits with banks and trust companies	431,459	293,059
Corporate notes	5,278	76,285
Government and government-guaranteed securities	15,463	39,097
	452,200	408,441

Corporate notes were recorded at cost which approximates market value. Government and government-guaranteed securities were recorded at the lower of cost or market value; market value as at December 31, 1982 was \$17 million (\$1 – \$39 million).

8. Fuel for electric generation	1982	1983
	\$'000	\$'
Inventories – coal	590,268	488,
– uranium	200,177	154,
– oil	11,397	38,
	801,842	681,
9. Unamortized advances for fuel supplies	1982	1
	\$'000	\$'
Coal	113,010	111,
Uranium	645,813	485,
	758,823	596,

Based on present commitments, additional advance payments for fuel supplies will total approximately \$149 million over the next five years, including approximately \$95 million in 1983.

10. Unamortized deferred costs	1982	1
	\$'000	\$'
Bruce Heavy Water Plant "D"	353,393	
Wesleyville Generating Station	41,400	
	394,793	

Bruce Heavy Water Plant "D"

As a result of recent forecasts projecting reduced heavy water production requirements, the Board of Directors decided that effective December 31, 1982, Bruce Heavy Water Plant "D" be considered an indefinitely deferred project with a low probability of construction being resumed in the future. Furthermore, the Board specified that the amortization of the capital cost of this project continue at an annual rate of 4% in 1983, and the unamortized cost as at January 1, 1984 be amortized for recovery through rates at an annual rate of 10% over the period 1984 to 1993. This unamortized cost was included in deferred construction projects as at December 31, 1981.

Wesleyville Generating Station

As a result of a recent review, the estimated value of the remaining assets of the Wesleyville Generating Station project was reduced by \$41 million, effective December 31, 1982. Furthermore, the Board of Directors specified that the \$41 million be amortized for recovery through rates at an annual rate of 10% over the period 1984 to 1993. This unamortized cost was included in construction in progress as at December 31, 1981.

Bonds and notes payable

bonds and notes payable, expressed in Canadian dollars, are summarized by years of maturity and by the currency in which they are payable in the following table:

Years of Currency	1982			1981		
	Principal Outstanding \$'000		Weighted Average Coupon Rate	Principal Outstanding \$'000	Weighted Average Coupon Rate	
	Canadian	Foreign	Total	Total		
—	—	—	—	419,561	—	
178,399	250,248	428,647	—	372,949	—	
99,277	111,697	210,974	—	214,173	—	
564,117	290,978	855,095	—	858,143	—	
—	145,982	145,982	—	148,118	—	
721,411	199,287	920,698	—	—	—	
5 years	1,563,204	998,192	2,561,396	10.8%	2,012,944	9.0%
10 years	424,823	2,384,875	2,809,698	12.9	1,438,805	11.7
15 years	670,074	373,247	1,043,321	8.1	890,081	8.3
20 years	2,542,616	559,828	3,102,444	11.3	2,957,761	10.7
25 years	1,407,807	1,307,806	2,715,613	9.5	2,454,611	9.6
30 years	1,706,000	2,150,856	3,856,856	11.5	4,085,849	10.8
	8,314,524	7,774,804	16,089,328	11.0	13,840,051	10.3
Currency in which payable:						
Canadian dollars		8,314,524			7,522,271	
United States dollars		7,653,712			6,185,064	
West German Deutsche marks		64,368			75,992	
Swiss francs		56,724			56,724	
		16,089,328			13,840,051	

bonds and notes payable in United States dollars include \$5,108 million (1981 — \$4,502 million) of Ontario Hydro bonds held by the Province of Ontario and having terms identical with Province of Ontario issues sold in the United States on behalf of Ontario Hydro. Except for these bonds and \$1,000 million (1981 — \$1,000 million) of bonds issued to the Province of Ontario with respect to Canada Pension Plan funds advanced to Ontario Hydro, all bonds and notes payable are guaranteed as to principal and interest by the Province of Ontario.

long-term bonds and notes payable in foreign currencies are translated into Canadian currency at rates of exchange at time of issue. If translated at year-end rates of exchange, the total amount of these liabilities would be increased by \$848 million at December 31, 1982 (1981 — \$681 million).

12. Other long-term debt	1982	1981
	\$'000	\$'000
The balance due to Atomic Energy of Canada Limited for the purchase of Bruce Heavy Water Plant "A". Under the purchase agreement, Ontario Hydro pays equal monthly instalments of blended principal and interest to December 28, 1992, with interest at the rate of 7.79%.	175,835	187,
Capitalized lease obligation for the head office building at 700 University Avenue, Toronto. The lease obligation is for the 30-year period ending September 30, 2005, payable in United States dollars at an effective interest rate of 8%.	41,310	41,
Capitalized lease obligations for transport and service equipment. Under these agreements, monthly instalments of blended principal and interest will be paid to 1988, at effective interest rates ranging from 6.8% to 18.25%.	24,014	31,
	241,159	260,
Payments required on the above debt, excluding interest, will total \$99 million over the next five years. The amount payable within one year is \$20 million (1981 — \$18 million).		
13. Accrued irradiated fuel disposal and plant decommissioning costs	1982	1981
	\$'000	\$'000
Accrued irradiated fuel disposal costs	60,669	
Accrued plant decommissioning costs	14,975	
	75,644	

Irradiated fuel disposal costs

Studies have been carried out to estimate the costs to be incurred for the disposal of irradiated nuclear fuel. The significant assumptions used in estimating the future irradiated fuel disposal costs were:

- an in-service date of the year 2000 for irradiated nuclear fuel disposal facilities;
- a transportation distance of 1,600 kilometres from nuclear generating facilities to disposal facilities; and
- interest and escalation rates through to the disposal date averaging 9.2% and 7.3%, respectively.

Because of the uncertainties associated with the technology of disposal and the above factors, these costs are subject to change.

Plant decommissioning costs

Studies have been carried out to estimate the costs of decommissioning a nuclear generating station. The significant assumptions used in estimating the future decommissioning costs were:

- decommissioning on the deferred dismantlement basis (dismantlement following storage with surveillance for a 30-year period after shutdown of the reactors);
- a transportation distance of 1,600 kilometres from nuclear generating facilities to disposal facilities; and
- interest and escalation rates through to the completion of decommissioning averaging 8.0% and 6.6%, respectively.

Because of the uncertainties associated with the technology of decommissioning and the above factors, these costs are subject to change.

14. Fuel used for electric generation

Ontario Hydro has contracted with Petrosar Limited for the purchase of 20,000 barrels of residual fuel oil per day through to April 1992. Deliveries in 1982 were 2% (1981 — 6%) of the contract quantities. Amounts have been charged to the costs of operations to provide for settlement with respect to reduced deliveries to date. Petrosar has commenced actions claiming damages for failure to take the contract quantities in 1981 and claiming compensatory payments in respect of the failure to take the contract quantities in 1982. Ontario Hydro is defending these actions.

15. Payment to Ontario Municipal Electric Association

The amount of this payment is equivalent to interest on the balance held for the benefit of Municipal Utilities in Reserve for Stabilization of Rates and Contingencies.

Net additions to fixed assets

additions to fixed assets are capital construction expenditures less the proceeds on sales of fixed assets. The proceeds on sales of fixed assets in 1982 and 1981 were insignificant. For 1983, net additions to fixed assets are estimated to be \$3,176 million.

Pension plan

The most recent actuarial valuation of Ontario Hydro's pension plan as at December 31, 1981 reported a surplus of approximately \$28 million (December 31, 1980 - \$17 million).

Significant actuarial assumptions used in the 1981 valuation (1980 valuation) were:
the used to discount future investment income 8.5% (1980 - 8.5%) and future benefits 8% (1980 - 8%);
ary escalation rate 8% (1980 - 8%);
verage retirement age for males 61.4 (1980 - 61.8) and for females 61.3 (1980 - 60.8); and
mon stocks valuation 5 year average (1980 - 5 year average).

experience surplus for 1981 of approximately \$34 million, partially offset by an additional unfunded liability of approximately \$23 million for plan improvements, increased the pension plan surplus by \$11 million.

pension plan costs for 1982 were \$70 million (1981 - \$60 million).

Research and development

In 1982, approximately \$61 million of research and development costs were charged to operations and \$5 million capitalized (1981 - \$50 million and \$5 million, respectively).

Comparative figures

ain of the 1981 comparative figures have been reclassified to conform with the 1982 financial statement presentation.

Auditors' Report

We have examined the statement of financial position of Ontario Hydro as at December 31, 1982 and the statements of operations, equities accumulated through debt retirement appropriations, reserve for stabilization of rates and contingencies and changes in financial position for the year then ended. Our examination was made in accordance with generally accepted auditing standards, and accordingly included such tests and other procedures as we considered necessary in the circumstances.

In our opinion, these financial statements present fairly the financial position of Ontario Hydro as at December 31, 1982 and the results of its operations and the changes in its financial position for the year then ended in accordance with generally accepted accounting principles. Further, in our opinion, such principles, except for the change in accounting for interest capitalized when a construction project is extended as described in the summary of significant accounting policies, have been applied on a basis consistent with that of the preceding year.

Toronto, Canada,
March 14, 1983.

CLARKSON GORDON
Chartered Accountants

Five Year Summary of Financial Statistics

	1978	1979	1980	1981
(in thousands of dollars)				
Revenues				
Primary power and energy				
Municipal utilities	1,275,107	1,441,557	1,603,072	1,800,129
Rural retail customers	442,224	474,795	513,616	545,760
Direct industrial customers	261,816	305,210	341,785	391,038
	1,979,147	2,221,562	2,458,473	2,736,927
Secondary power and energy	288,533	346,558	360,742	424,581
	2,267,680	2,568,120	2,819,215	3,161,508
Less excess revenues ⁽¹⁾	130,292	—	—	—
	2,137,388	2,568,120	2,819,215	3,161,508
Operating costs				
Operation, maintenance and administration	501,800	601,422	639,572	764,712
Fuel used for electric generation ⁽²⁾	508,903	608,615	674,085	765,429
Depreciation	265,060	284,610	305,967	324,596
Other ⁽²⁾	144,885	151,651	148,528	190,720
	1,420,648	1,646,298	1,768,152	2,045,457
Income before financing charges and extraordinary item	716,740	921,822	1,051,063	1,116,051
Financing charges				
Interest on bonds, notes and other debt	899,817	1,029,568	1,165,921	1,369,933
Capitalized interest	(304,119)	(341,073)	(401,254)	(627,758)
Investment income	(76,249)	(105,163)	(109,268)	(84,685)
	519,449	583,332	655,399	657,490
Foreign exchange	29,346	70,875	19,238	51,743
	548,795	654,207	674,637	709,233
Income before extraordinary item	167,945	267,615	376,426	406,818
Extraordinary item	20,500	—	160,000	—
Net income	147,445	267,615	216,426	406,818
Financial position				(in thousands of dollars)
Total assets	13,162,506	14,513,729	15,593,347	17,829,621
Fixed assets	11,340,961	12,628,842	13,630,177	15,447,525
Long-term debt	10,226,763	11,134,185	12,005,058	13,662,582
Equity	1,802,793	2,069,538	2,284,277	2,689,653
Major sources of funds				(in thousands of dollars)
Operations ⁽²⁾	444,575	582,424	692,377	751,019
Bonds and notes payable and other long-term debt – net increase ⁽²⁾	1,488,239	1,098,025	862,249	1,716,204
Major application of funds				
Net additions to fixed assets	1,652,043	1,574,716	1,469,550	2,144,210
Unamortized advances for fuel supplies – net increase	45,626	126,680	146,722	182,719
Financial indicators				
Interest coverage ⁽⁵⁾	1.19	1.26	1.32	1.30
Debt ratio ⁽⁶⁾	.853	.848	.846	.841
Return on average rate base (%) ⁽⁷⁾	9.4	10.1	10.8	11.3

	1978	1979	1980	1981	1982
verage revenue per kilowatt-hour⁽¹⁾⁽³⁾					(in mills per kilowatt-hour of total energy sales)
ary power and energy					
unicipal utilities	20.81	22.76	24.70	27.10	29.81
ral retail customers	34.21	36.49	39.70	42.69	44.82
rect industrial customers	17.72	19.37	20.80	22.90	26.14
ndary power and energy	27.76	29.72	33.63	38.38	38.95
lassifications combined	22.82	24.75	26.85	29.45	32.04
					(expressed as a %)
rage rate increases⁽¹⁾					
icipal utilities	9.4	9.8	8.6	9.3	9.6
l retail customers	9.8	7.0	6.2	11.2	8.7
ct industrial customers	10.3	10.1	7.1	9.6	10.0
rage cost per kilowatt-hour⁽³⁾⁽⁴⁾					(in mills per kilowatt-hour of energy generated)
raulic					
operation, maintenance and administration	.86	.98	1.09	1.49	1.68
el - water rentals	.48	.52	.58	.66	.73
preciation and financing charges	3.39	3.26	3.24	3.51	3.60
	4.73	4.76	4.91	5.66	6.01
ear					
operation, maintenance and administration	3.12	3.32	3.49	4.11	4.87
el - uranium	1.61	1.94	2.39	2.32	3.84
preciation and financing charges	8.69	9.26	7.65	8.07	8.83
	13.42	14.52	13.53	14.50	17.54
il					
operation, maintenance and administration	2.98	3.27	3.42	3.74	4.03
el - coal, gas and oil	15.42	17.08	18.56	20.97	23.29
preciation and financing charges	6.90	7.15	6.45	6.11	6.84
	25.30	27.50	28.43	30.82	34.16

notes

Ontario Hydro was required by the Province of Ontario to conform with the spirit and intent of the Federal Anti-Inflation program as applied to net income for the year 1978. Excess revenues were applied to reduce customers' bills in 1979 and 1980. Figures for 1978 are before deduction of excess revenues.

Figures for 1978-1981 have been reclassified to conform with 1982 financial statement presentation.

Figures for 1982 are preliminary.

Average cost per kilowatt-hour represents the costs attributable to generation but excludes the costs related to transmission, distribution and corporate administrative activities. These figures reflect the historical accounting costs of operating facilities and the total energy generated by these facilities during the year.

Interest coverage represents income before extraordinary item plus gross interest (interest on bonds and notes payable, short-term notes payable, other long-term debt, and accrued irradiated fuel disposal and plant decommissioning costs) less interest on other accrued costs, divided by gross interest.

Debt ratio represents debt (bonds and notes payable, short-term notes payable, other long-term debt, and accrued irradiated fuel disposal and plant decommissioning costs) divided by debt plus equity.

Return on average rate base represents income before extraordinary item plus gross interest (interest on bonds, notes and other debt, and other accrued costs) divided by average rate base (total assets less long-term and current accounts payable and accrued charges, accrued interest, and contributions from the Province of Ontario as assistance for rural construction).

Comparative Statistics

	1978	1979	1980	1981	1982
Customer Statistics ⁽¹⁾					(in millions of kilowatt-hours)
Primary energy sales					
Municipal utilities	61,285	63,349	64,899	66,416	67,120
Rural retail	12,927	13,011	12,936	12,783	12,600
Direct industrial	14,775	15,757	16,432	17,077	15,300
	88,987	92,117	94,267	96,276	94,020
Secondary energy sales	10,393	11,662	10,727	11,063	10,200
Total Ontario customers:					(in thousands)
Residential	2,411	2,449	2,493	2,528	2,550
Farm	115	113	112	110	105
Commercial and industrial	307	316	322	329	330
	2,833	2,878	2,927	2,967	3,000
Average annual use:					(in kilowatt-hours per customer)
Residential	9,797	9,839	9,821	9,852	9,850
Farm	18,279	19,225	19,978	20,731	21,000
Commercial and industrial	200,601	204,113	202,582	204,575	195,000
Average revenue:					(in cents per kilowatt-hour)
Residential	2.98	3.22	3.60	3.96	3.96
Farm	3.21	3.42	3.74	4.11	4.11
Commercial and industrial	2.17	2.35	2.66	2.92	2.92
Operating Statistics ⁽²⁾					
Dependable peak capacity ('000 kW)	22,845	24,429	24,457	24,595	24,600
December primary peak demand ('000 kW)	15,722	16,365	16,808	16,600	16,500
Primary energy made available ('000,000 kW·h)	95,373	98,127	100,174	101,659	100,000
Total Staff, average for year	27,850	28,385	28,902	30,850	32,000

Footnotes

(1) Figures for 1982 are preliminary.

(2) Includes mothballed generation: 1979 - 550,000 kW; 1980 - 1,704,000 kW; 1981 - 1,913,000 kW and 1982 - 3,034,200 kW.



Ontario Hydro
Head Office, 700 University Avenue,
Toronto M5G 1X6

ISSN 0382-2826/Printed in Can

2 ON

5

Ontario Hydro

We must not neglect
the proven in the search
for the possible.

1983 Annual Report



The Corporation

Ontario Hydro is a corporation without share capital created by a special statute of the Province of Ontario in 1906. It now operates under the authority of the Power Corporation Act, R.S.O. 1980, Chapter 384, as amended, with broad powers to generate, supply and deliver electric power throughout the province. It is also authorized to produce and sell steam and hot water as primary products. The Corporation's prime objective is to supply the people of Ontario with electricity at the lowest feasible cost consistent with high safety and quality of service standards.

Ontario Hydro's main activity is wholesaling electric power to municipal utilities in urban areas, who in turn retail it to customers in their service areas. Ontario Hydro also serves directly more than 100 large industrial customers and about 768,500 rural retail customers in areas or communities not served by municipal utilities. In 1983, approximately 3,048,000 customers were served by Ontario Hydro and the municipal utilities in the province.

Ontario Hydro operates 79 hydraulic, fossil and nuclear generating stations and an extensive power grid across Ontario to meet the province's demands for electric energy. Interconnections with other systems place the Corporation in an extensive electrical grid that covers a large segment of the North American continent.

In addition, Ontario Hydro exercises certain regulatory functions over municipal utilities and also exercises the approval and inspection functions for electrical equipment (in conjunction with the Canadian Standards Association) and electrical wiring installations throughout the province.

Ontario Hydro is a financially self-sustaining corporation. The Province of Ontario guarantees bonds and notes issued to the public by the Corporation.

Ontario Hydro's head office is located at 700 University Avenue, Toronto, Ontario. For administrative and operational purposes, six regional and 53 area offices are maintained throughout the province.

The business and affairs of Ontario Hydro are directed and controlled by a board of directors consisting of a chairman, a president, a vice-chairman, and not more than 10 other directors. All of the members of the board are appointed by the Lieutenant-Governor in Council of the province except the president who is a full-time employee of the Corporation appointed by the Board.

To assist the Board in directing the Corporation's affairs, there are five Committees of the Board - Finance, Audit, Management Resources, Social Responsibility, and Technical Advisory. These committees review and make recommendations to the Board on matters within their terms of reference.

**Report of the
Board of Directors of
Ontario Hydro for the Year 1983**

To:

The Honourable Philip Andrewes,
Minister of Energy

We, the Board of Directors, submit to you this report of the financial position and relevant Ontario Hydro activities for the year 1983. We would like to thank you and the staff of the Ministry of Energy for the cooperation and understanding extended during the year.

On behalf of the Board

Milan Nastich

Milan Nastich
May, 1984

Financial Highlights

	1983	1982
(in thousands of dollars)		
Revenues	3,805,131	3,387,630
Net income	471,651	348,419
Total assets	23,193,894	20,720,832
Net additions to fixed assets	2,709,542	2,883,039

Message from the Chairman



For Ontario, 1983 was a year in which economic uncertainty gradually gave way to cautious optimism. It was a year in which the people of Ontario showed their resilience and capacity to adjust to new and more difficult circumstances.

In that vein, Ontario Hydro also redirected its resources to improve its ability to respond to those rapidly changing economic circumstances. Costs were cut, programs adjusted and policies changed to keep rates at the lowest level over the long term – without jeopardizing customer service.

Our key to more flexibility involves making the best use of Hydro facilities – existing generating capacity, nuclear stations under construction, existing and future transmission facilities and upgraded interconnections with neighbouring utilities.

For power consumers, the benefits will be a more efficient and more customer-oriented utility which will cut costs without cutting standards, and thus provide Ontario with competitively priced and reliable electricity.

We are well aware of our responsibilities to the people of Ontario. For more than 77 years, Ontario Hydro has taken those responsibilities seriously and, in so doing, earned a reputation for high quality service and impressive technological achievement. That pursuit of excellence remains an integral part of the motivation of Hydro's dedicated and resourceful staff.

The year 1983 was also one of unexpected challenges. During the summer, the rupture of a pressure tube in one of the units at the Pickering generating station heightened public interest in Ontario Hydro's nuclear program.

This incident demonstrated the ability of the CANDU design to sustain safely a major component failure. When the unit was taken out of service, the higher cost of replacement power from our coal-fired stations underlined just how economic nuclear power is.

Nuclear power will continue to play a major part in the development of an economic power system that provides reliable electricity at lowest possible cost. But there are also important roles for coal, water, and alternative technologies. By drawing on a variety of energy sources, an economic and environmentally sound electricity system will be maintained.

At this time, I would like to thank Hugh Macaulay, who resigned March 31, 1983, and whose guidance and assistance helped the Corporation position itself to meet the future needs of the province.

I would also like to thank the Board of Directors and senior management – in particular, Senior Executive Vice-President Pat Campbell and Executive Vice-President, Operations, Arvo Niitenberg – for their help.

And finally, on behalf of Hydro, I would like to express my appreciation to the three associations that represent a large segment of our customers – the Ontario Municipal Electric Association, the Association of Municipal Electrical Utilities, and the Association of Major Power Consumers in Ontario. Their cooperation is reflected in their dedicated service to the people of Ontario.

Helen Nestich

Interview with Milan Nastich

Q. Late in 1982 Hydro announced a new corporate strategy which shifts priorities from expanding the system through construction to maximizing use of existing resources. What did that strategy accomplish in 1983?

A. The first and major accomplishment has been the setting of a new corporate direction. Clarity of mission is one of the most important needs in an organization the size of Ontario Hydro, and the new corporate strategy gives us that. It tells the people of Ontario, our owners, what to expect from their utility.

I think it's safe to say that, in the past, we focused on meeting the demand for electricity, mainly by increasing the supply. Now we're focusing our efforts on managing both demand and supply to achieve the lowest possible price for electricity. On the marketing side, we're looking at encouraging new energy efficient electricity applications that benefit the consumer and support federal and provincial off-oil policies. It's entirely possible that in our marketing activities in the 1990s we'll want to place even greater emphasis on load management and energy efficiency. This will help balance customer needs and system capabilities and bring the maximum economic benefit to our customers. On the supply side, of course, we will complete the current construction program as expeditiously and as economically as possible.

Q. Once you have the new generation in place, will you have the power system you need?

A. Not completely. We'll have enough generation facilities in place – at least through the 1990s – but that's only part of the story. What we need is added transmission. We have to get the power from where it's made to where it will be used. The major transmission projects in eastern and southwestern Ontario are designed to do just that. We're in the midst of that process now, working with people in those parts of the province, and with the Joint Hearings Board which will decide the location of the lines. And once the bulk transmission is in place, there will have to be continuing efforts to build up the distribution system in Ontario to maintain a reliable supply of electricity to our customers.

Q. Most North American utilities find themselves with surplus capacity due to forecasts that turned out to be too high. Can you do better in future?

A. Forecasting methods will improve, but can never insulate us entirely from unexpected events. In the past, utilities generally chose the lowest-cost option, which usually meant building large generating stations that provide a low unit cost. But the risk is that if forecasts of demand turn out to be too optimistic, then the electricity facilities will not be used initially to full capacity. Our new approach is, first, to try to be ready to meet a range of possibilities and, second, to add smaller increments of capacity. While it may be somewhat more costly, this new approach results in more effective responses to changing circumstances. Flexibility and quickness of response have to be two of our major aims for the balance of this century.

Q. If minimizing costs is a key part of your new approach, are Hydro's customers going to notice any decline in service or reliability?

A. I believe not. I have a great deal of faith in Hydro people. They can put their intelligence and inventiveness to work in making optimum use of available resources, and thus provide the same excellent service as they have in the past.

Q. Does the failure of a pressure tube in 1983 at the Pickering nuclear generating station mean Hydro should rethink the economics of the nuclear option? Is the construction of the Darlington nuclear station, scheduled to be in service by 1992, still a sound proposition?

A. The pressure tube problem at Pickering doesn't alter the relative economic advantage of Ontario's nuclear plants compared to the next feasible alternative – coal-fired plants. The pressure tubes were scheduled to be replaced sometime during the life of the reactor – now the replacement will

have to happen sooner than we'd earlier thought. In any event, what is learned at Pickering will be applied to Darlington. Our forecasts show that Darlington remains a good bet for all but the most pessimistic scenario, which assumes virtually no growth at all for the next 15 years. So, for a wide range of realistic probabilities, Darlington remains an economic investment for the people of Ontario.

- Q. Hydro's debt has attracted the attention of critics in 1983. Is this debt of \$20 billion too high?
- A. Our debt certainly attracted attention. I wish our assets of \$23 billion had attracted as much. Hydro has not overextended itself. Debt, in itself, is neither good nor bad. Electrical utilities are, by and large, debt-financed, because of the large capital cost of new facilities. The underlying principle is that the customers who'll use the new facilities when they come into service some 15 years later are also the people who should pay for them. In fact, Hydro's financial soundness will be improving as we finish off our construction program. Our debt ratio is rapidly approaching the targets that we've set, and in 10 years our debt will be, in today's dollars, about \$15 billion – significantly lower than today. Our debt is an investment in the future, in a power system which will produce electricity and revenues for 50 to 60 years.
- Q. How well did Hydro relate to its customers in 1983?
- A. My reading is that the people in Ontario generally feel electricity is a good buy. On the customer reliability side, which is very important to people, we've had a good year. People have been able to turn their light switches on when they wanted. Most of our major customers are aware that electricity helps give them a competitive edge. It's reliable and relatively cheap. I think our customers also realize we are working hard on their behalf to keep it that way.
- Our relationship with our major customers, through the OMEA, AMEU and AMPCO, improved this year. That's important because, as you know, Ontario has a rather unusual electrical utility network. Hydro sells most of its power to local municipal utilities, so that most end users of electricity are not our direct customers. We want to work even more closely with these associations, as well as with groups such as electrical manufacturers and contractors, to ensure that we provide the service that our customers need and want.
- Q. Other Canadian utilities, like Hydro-Quebec, are seeking to increase power exports to the United States. Will Ontario Hydro continue to compete for these markets as well?
- A. We certainly will. The pursuit of export markets is an important part of our corporate strategy, because it is of great benefit to all concerned. The income from export sales in 1983, for instance, reduced Ontario electricity rates by close to 5 per cent. Furthermore, it helped improve Canada's balance of payments position.
- Exports of Ontario-manufactured electricity also benefit American customers by helping to moderate their electricity rates. Furthermore, by building the interconnections needed for selling power, we are increasing the reliability of electricity supply on both sides of the border by strengthening our ability to buy and sell power in emergency situations.
- Q. Your predecessor, Hugh Macaulay, said last year that the toughest challenge for Hydro in the mid-1980s would be keeping the price of electricity down. With revenues up in 1983, has that challenge been largely met?
- A. No. That challenge will stay with us through the '80s. It's definitely not a one-year effort. While there are unknowns facing us, our assessment of the most likely future is that electricity prices will remain competitive. But it requires effort, dedication and ingenuity.

The Economic Environment

Over the last 10 years, the Canadian and Ontario economies have been volatile, in large degree due to the unsteady nature of U.S. and world economies and to unpredictable changes in world oil prices. Real growth in Canada's gross national product has been uneven since 1973, with rather severe cycles of slumps followed by recovery.

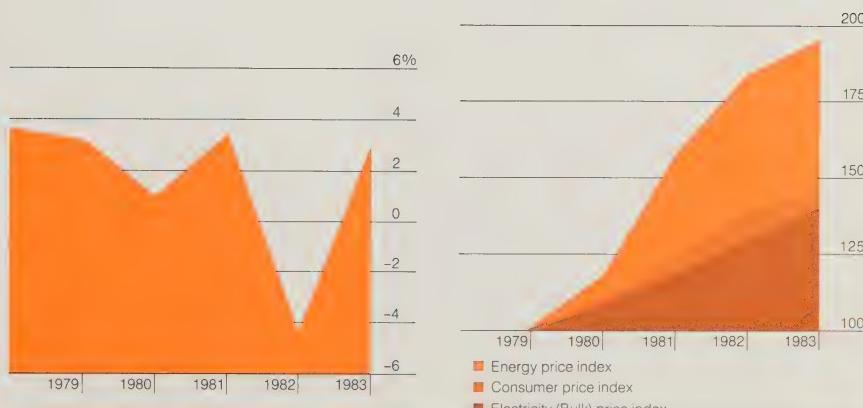
Rapid and severe changes in growth patterns pose problems for electrical utilities whose generating stations need lead times of 15 years or more from planning stage to completion. The difference over 20 years between a slow growth and fast growth scenario can have a dramatic impact on the demand for electricity, and the capacity a utility needs to meet that demand.

The turnaround in the economy in 1983 suggests that economic swings are still with us and that long-term planning will require a large degree of flexibility. The severe recession of 1981-82, which resulted in a slight decline in Ontario's electricity demand in 1982, was followed by recovery during 1983.

This recovery was led by increases in consumer spending as lower interest rates and some governmental policies encouraged consumers to spend some of their accumulated savings. As they did so, the improving economy further bolstered consumer confidence and helped to promote consumer spending generally. In response to increased demand for consumer goods and services, businesses began to fill new orders by increasing production and rehiring workers.

Despite this consumer-led recovery, manufacturing industries' utilization rates are still low, around 70 per cent. Most industries can easily increase production without adding to their existing capacity. Economic forecasts suggest that businesses won't have to start adding new plant and equipment until 1985. When that happens, Ontario industries that produce capital goods are expected to raise production to meet increasing demand.

The increased demand for customer goods, and particularly industrial expansion, will mean heavier demand for electrical power.



Economic Growth: Canada

Real Gross National Product
Annual Average Percent Change

Price Change Comparison in Ontario

(1979 = 100)

Electricity Production

8

Record energy, peak demand

The year 1983 marked a real turnaround for Ontario Hydro. As the province climbed out of a severe recession, which brought an actual drop in primary electrical energy demand of 0.8 per cent in 1982, records were set in electricity demand during 1983.

A mild winter and a weak economy during the first four months of 1983 gave way to a hot summer, stronger industrial activity and extremes of cold in the last month of the year. These circumstances, coupled with weak demand in the corresponding period in 1982, contributed to a year-to-year average growth in primary energy demand of about 11 per cent for the May to December period.

Over the whole year, Ontario Hydro satisfied an all-time high of 106.1 billion kilowatt-hours in provincial primary energy demand – 5.2 per cent more than in 1982.

The year's primary peak demand of 18.8 million kilowatts on December 21 was also a record, surpassing 1982's peak, set on January 18 of that year.

In 1983, Hydro delivered a total of 118.0 billion kilowatt-hours of electricity to the bulk electricity system, of which 94 per cent was generated from its own resources. Purchased energy, including Douglas Point's production of 1.2 billion kilowatt-hours, provided the balance.

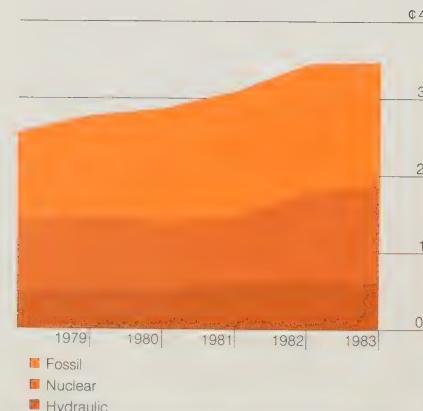
Hydro's CANDU nuclear units supplied 38.3 billion kilowatt-hours, a 10 per cent increase over 1982. This represents 32.5 per cent of total energy generated and purchased, and reflects the additional nuclear production provided by unit 5 at Pickering B which came into service in May.

Hydro-electric production also experienced a year-to-year increase, up 6.1 per cent to 36.6 billion kilowatt-hours – or 31 per cent of total energy made available. Above-normal water flows, which prevailed on some major rivers during the first half of the year, were the primary reason for this increased output.

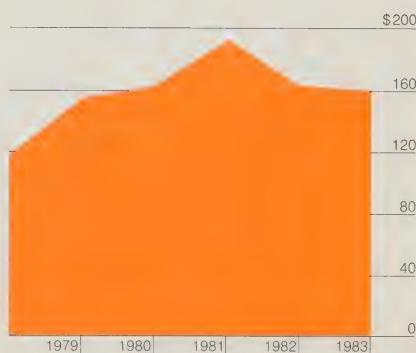
The rate of fossil-fired generation fluctuated considerably during the year, from a low in June to a record high in December. This reflected extreme winter and summer weather conditions, unavailability of some nuclear units, and wide variations in industrial loads. Coal-fired units provided virtually all of the 35.8 billion kilowatt-hours of fossil generation and accounted for 30.4 per cent of the electricity supplied for Ontario Hydro customers during the year.

Exports earn income as purchases reduce costs

The Corporation's earnings from an unprecedented volume of export business in 1983 benefitted Ontario consumers. Hydro earned an income of \$159.8 million from the sale of 11.9 billion kilowatt-hours of electricity to utilities in New York, Michigan, Ohio and Vermont. As in previous years, these export sales produced a two-fold economic advantage: they not only



Average Cost of Generation
(In cents per kilowatt-hour of energy generated)



Income from Export Sales
\$ Millions



lowered the cost of electricity within the province, but they also improved Canada's balance of payments with the United States. In 1983, Hydro's income from power exports reduced the cost of providing electricity to Ontario consumers by almost 5 per cent.

At the same time, excluding Douglas Point's production, Ontario Hydro purchased 5.8 billion kilowatt-hours of electricity from other utilities, primarily from Quebec and Manitoba, at a cost of approximately \$96 million. Purchasing, rather than generating, this power netted savings to Hydro's customers of approximately \$20 million.

A responsibility to prepare for the future

Ontario Hydro is continuing its efforts to match resources as closely as possible with the province's need for electricity. These efforts have led Hydro to scale down its generating construction program considerably since the mid-1970s when the forecasts called for 7 per cent annual load growth. Since 1975, more than 12 million kilowatts of planned generating capacity has been cancelled - the equivalent of three Darlington stations.

Based on the latest long-term forecast of 2.4 per cent average annual growth, the current expansion program will add almost 8.2 million kilowatts of capacity, primarily nuclear, by 1992. By that time, nuclear energy is expected to provide almost two-thirds of the province's electricity.

The first nuclear unit at the Pickering B station went into commercial service during 1983. Two Pickering B units and the single-unit lignite-fired Atikokan station are scheduled to go into service during 1984.

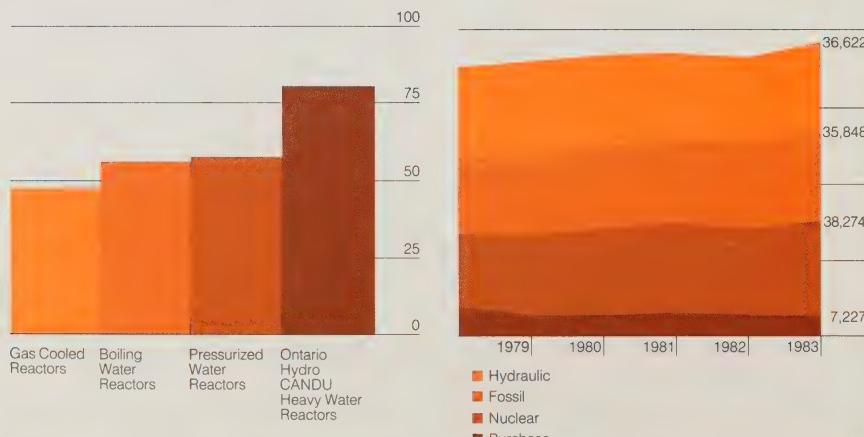
Meanwhile, construction continued at the site of the four-unit Darlington nuclear generating station, which is expected to be placed in service between 1988 and 1992. At year's end, almost 3,000 workers were employed on that project.

Hydro reduces dependence on fossil fuels

Lower than expected load growth, environmental considerations, and the need to keep overall costs of operating the power system as low as possible have all prompted Hydro to lessen its dependence on its older fossil-fired generating stations. As in the previous three years, more coal-fired units were either completely taken out of service or placed in a condition which permits restart within weeks if required.

Accordingly, after providing more than 30 years of reliable electrical service, the partially closed Richard L. Hearn station was taken out of service pending a review of its future. Also closed during the year were two units at the 30-year-old J. Clark Keith Generating Station.

In 1983, coal-fired plants continued to be an important source of power for meeting peak loads during periods of heavy demand. Actual coal burned in 1983 to generate 32.4 per cent of Hydro's electricity production totalled 12.9 million megagrams.



World Nuclear Power Reactor Lifetime Performance

Gross Capacity Factor (%)

Energy Made Available

Millions of k.W.h

Economics favour nuclear

The performance of Hydro's CANDU reactors in 1983 demonstrated nuclear power's economic advantages over coal for meeting the province's base load generation requirements.

Ontario Hydro's total cost of generating one kilowatt-hour of electricity from nuclear stations averaged 1.87 cents in 1983 compared to 3.45 cents for electricity from fossil stations.

Forecasts of unit energy costs continue to favour the economics of nuclear over coal. These costs include operation, maintenance, administration, fuel, depreciation and financing charges. In arriving at these costs, Hydro takes into account the historical accounting costs of operating facilities and the actual energy generated by these facilities during the year.

Providing electricity at a cost of 0.58 cents per kilowatt-hour in 1983, the Corporation's 68 hydro-electric generating stations remained the least expensive of Hydro's generation.

Hydro's nine CANDU reactors completed another year of outstanding productivity in 1983. Four of them ranked in the top 10 in a world-wide comparison of more than 160 operating reactors of similar size.

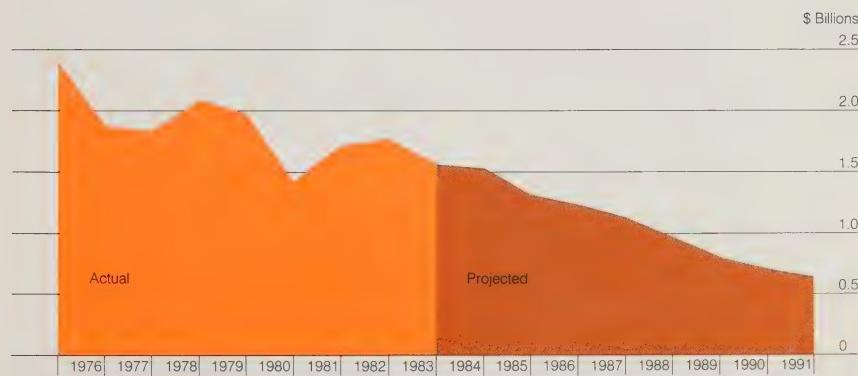
On a lifetime basis, Bruce unit 3 holds the distinction of first place in this comparison, while Bruce unit 4 occupies second position on a lifetime basis as well as for 1983.

Pickering unit 5 experienced a successful initial operating period, reporting an average capacity factor of 92 per cent during its first eight months of service.

Bruce A achieved outstanding performance in 1983 with a station capacity factor of 90.1 per cent – that is, the four units were running and producing power more than 90 per cent of the time throughout 1983. Despite the pressure tube problems at units 1 and 2, Pickering A achieved a capacity factor of 76.2 per cent.

Corporate purchases declining

The downward trend in capital construction activity meant that Hydro spent about 29 per cent less in 1983 than 1982 on equipment, materials, and services. Canadian sources received 85 per cent of the \$550 million Hydro spent on equipment, materials and services in 1983, and 90 per cent of Canadian purchases were made in Ontario. In addition, Hydro spent almost \$907 million on primary fuels, 79 per cent for fossil fuels and the balance for nuclear. Those expenditures represent a reduction of more than 13 per cent from 1982 fuel costs.



1976-1991 Construction Activity

In Constant 1983 Dollars

(Excluding interest capitalized and future use heavy water)

The year 1983 saw completion of a number of transmission line projects, including a new double-circuit 345,000-volt interconnection with the Power Authority of the State of New York. This project improves system security and increases power exchange capability with New York state. In the northwest part of the province, a new 230,000-volt transmission line, stretching from Marmion Lake to the MacKenzie transformer station, will tie in Atikokan generating station when it comes into service in 1984.

Responsible planning for the future

Ontario Hydro is a leader in building public participation programs into system expansion planning. In 1983, it completed another phase in the largest such project ever undertaken by a Canadian utility. This lengthy study, underway since 1980, involves finding suitable locations for transmission lines in southwestern Ontario and a transformer station in the London area. Public involvement in this phase of the project culminated on December 1, 1983 with the submission of a Route Stage Environmental Assessment to the Minister of the Environment for government and public review.

By year's end, the Joint Board, constituted under the Consolidated Hearings Act, had scheduled preliminary hearings for February, 1984, prior to conducting a full public inquiry into Hydro's route stage proposal.

A similar major transmission study is in progress in eastern Ontario. Transmission facilities are needed to meet the growing demand for electricity, particularly in the Ottawa area, and to strengthen Hydro's interconnection with Hydro-Quebec. By year's end, alternative routes for two new 500-kilovolt lines between Kingston and Ottawa had been identified.

Hydro is applying to the Joint Board to amend the eastern Ontario study by separating the interconnection with Hydro-Quebec from the facilities required for the supply of Ontario Hydro customers. This is being done to avoid additional delays in transmission facilities required to reliably supply the rapidly growing loads in the Ottawa area.

Public hearings on the supply to the Ottawa area are expected to begin early in 1985 following Hydro's submission of a Route Stage Environmental Assessment.





Improving air and water quality

With the conversion of a second Nanticoke generating unit to low nitrogen oxide (NO_x) burners, Hydro was able to reduce its NO_x emissions. Each unit equipped with low- NO_x burners cuts down its nitrogen oxide emissions by 25 per cent. All eight units at this station will be retrofitted with these burners in the future.

Because two nuclear units were out of service for several months and increase in demand was higher than expected, Hydro had to depend more heavily on its coal plants in 1983 than planned. Consequently, it was unable to reduce sulphur dioxide emissions as expected. This, however, will not affect Hydro's commitment to cut total acid gas emissions to 450,000 tonnes by 1986 and, ultimately, to 300,000 tonnes by the end of the decade.

In cooperation with other organizations such as the Canadian Electrical Association, Ontario Hydro participated during the year in acid rain studies and research. The purpose is to evaluate the effects of acid rain on the environment, and to identify the atmospheric process by which sulphur and nitrogen oxides are converted into acid rain. These research activities should help develop economic and effective ways to control acid rain across North America.

In addition to acid rain research, Ontario Hydro continued with environmental monitoring programs. These programs, which generally monitor the aquatic, atmospheric, and terrestrial environments, are started before the construction of all major Ontario Hydro projects and continue for several years into the operation phase. The purpose is to verify previous predictions of environmental effects and to identify any significant environmental impacts which require action.

Among other environmental activities, the Mississagi River Bank Stabilization Project exemplifies initiatives which Ontario Hydro undertakes to protect natural resources. Work on the river slope stabilization project, downstream from the Red Rock Falls generating station, progressed during the year and is scheduled to conclude in 1985.

Also in 1983, Hydro reached a milestone in its research, design and development efforts for securing improved cooling systems at thermal stations. The adoption of a flat slotted intake design for Darlington will considerably reduce the entrapment of fish into the station's cooling system.

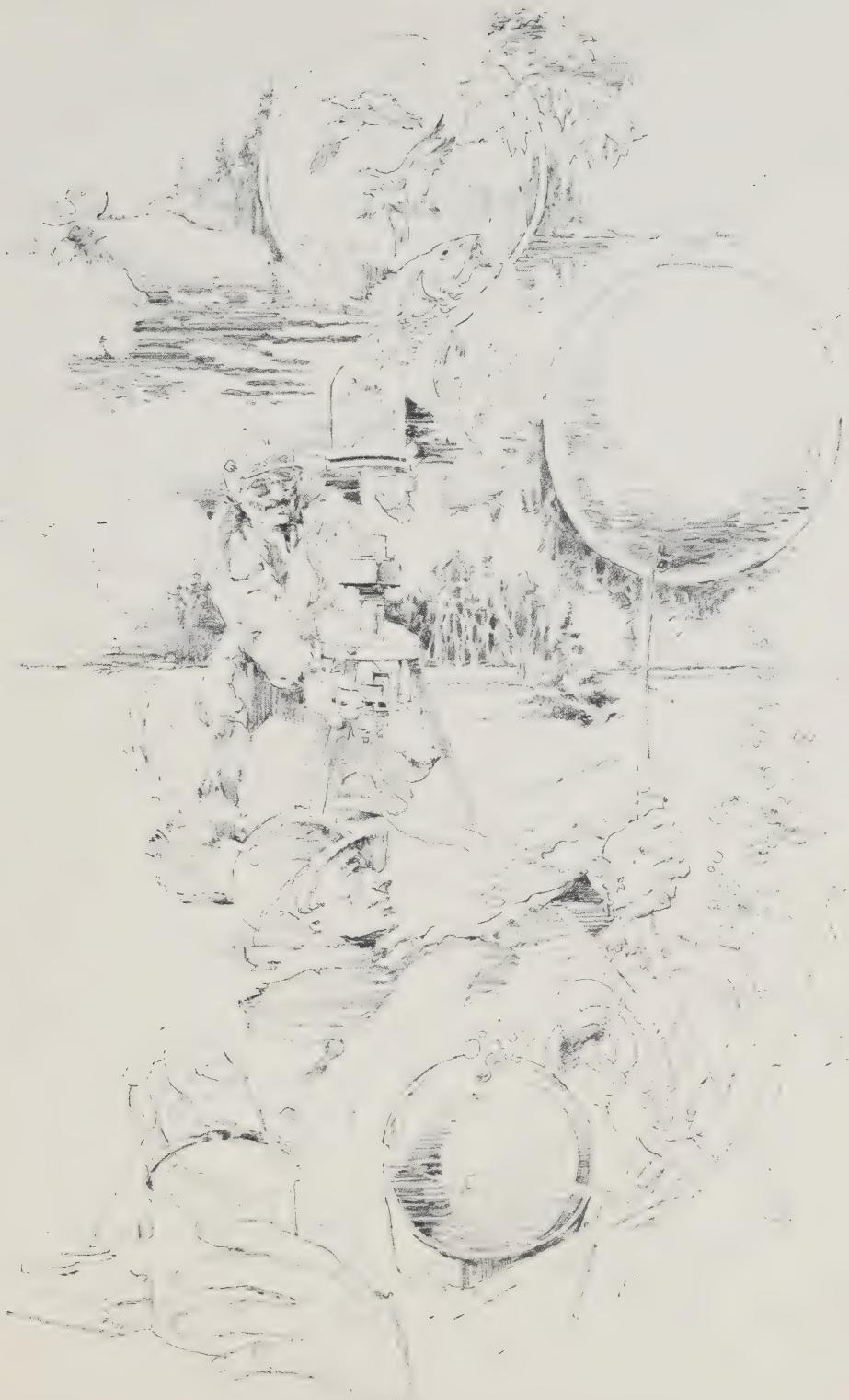
A proud record of safety in the nuclear workplace

The high level of performance that has been achieved in employee and public radiological safety in the nuclear program continued in 1983. The average amount of radiation received by nuclear station workers in the course of their work was less than one sixth of the maximum amount permitted under Atomic Energy Control Board regulations.

In 1983, Hydro's nuclear operating staff took considerable pride in working more than 10 million hours with a very low conventional accident rate of less than two lost-time accidents per million employee-hours and no incidence of whole-body radiation exposure beyond regulatory limits. This has extended Ontario Hydro's nuclear operations record to 21 years without a conventional occupational fatality or a radiation incident that resulted in any form of acute radiation injury to employees or the public. At the same time, there were no radioactive air or water emissions of any consequence to the public.

The Corporation's diligence in assuring the safety of its employees and the public was reflected in the handling of the pressure tube failure at Pickering on August 1. The quick and competent response of control room operators in shutting down the unit 2 reactor meant that the automatic shutdown systems did not have to be used. There was no release of radiation, no injury and no damage to the reactor. The staff's response attests to the high calibre of Hydro's nuclear operator training program.

In 1983, Hydro continued its intensive program of monitoring radiation levels in the area around nuclear sites. About 12,000 environmental measurements confirmed that radioactive emissions were typically less than 1 per cent of the maximum permitted by the Atomic Energy Control Board.



A new structure to meet new needs

Ontario Hydro's corporate strategy for the 1980s is to serve better the interests of energy users across the province. One way to do this is to develop wiser and wider uses for electricity.

Achieving this goal means strengthening customer relationships with municipal utilities, and direct industrial and rural customers.

Hydro created separate Regions and Marketing Branches in March to focus attention on customer needs – both traditional needs for reliable and reasonably priced electricity, and emerging needs for new and more energy efficient applications for electricity.

Part of the mandate of the Regions Branch is to serve Hydro's rural customers. Major priorities for the new branch are to be responsive to customer needs while implementing productivity improvements and delivery of marketing programs.

One of the challenges facing any corporation which has made cost cutting an important goal is to maintain high standards of service. In 1983, the Regions Branch was able to reduce – without negative impact on service – some of the resources which serve rural customers. Hydro's Niagara Region was phased out and its responsibilities absorbed by the neighbouring Western and Central Regions. This reduces expenditures by about \$4 million per year.

Maximizing benefits to customers

The new Marketing Branch provides reorganizational support for new customer-oriented initiatives and programs. The Branch consists of Customer Service, Market Development, New Business Ventures, and Marketing Operations Divisions.

Ontario Hydro's marketing initiatives have several objectives. Specifically, they are:

- 1) to encourage the efficient use of energy across the province;
- 2) to encourage the use of electricity where it will maximize the benefits to customers;
- 3) to develop the kind of electrical loads which will allow customers to get the most economic use out of Ontario's electrical utility systems;
- 4) to assist provincial and national programs in reducing Canada's dependence on oil.

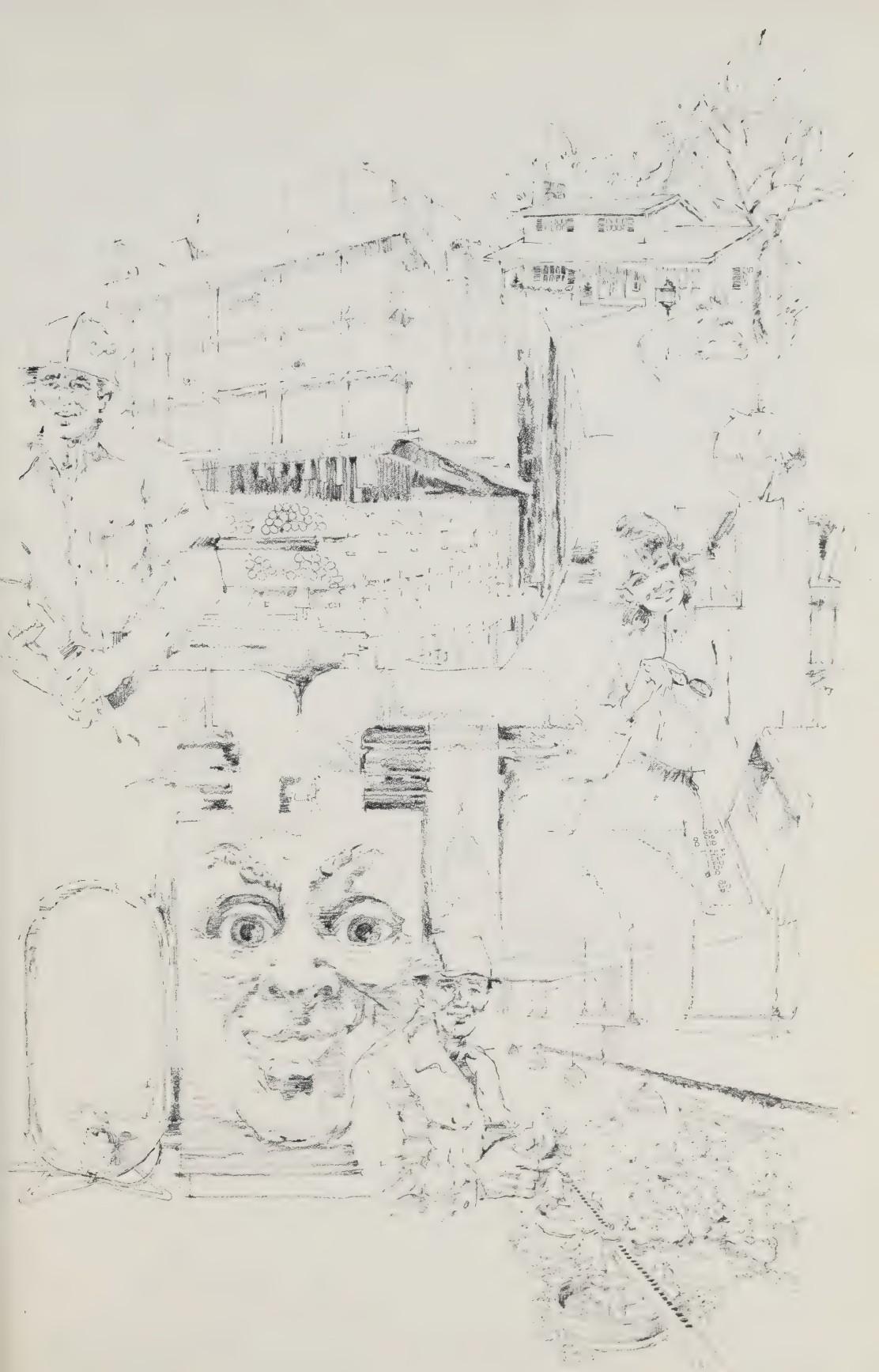
Assessing customer needs

Over the years, Ontario Hydro has developed a high level of customer confidence not only as a reliable supplier of energy, but also as a source of energy information. The Residential Energy Advisory Program (REAP) has been a significant achievement in this direction. Hydro and participating municipal utilities have conducted thousands of surveys which have given homeowners valuable information on improving the energy efficiency of their homes.

Providing customers with information is only one side of the story. With the new Marketing Operations Division, which was formed in October, Hydro is placing an increasing emphasis on listening to customer needs.

Much of the initial activity of this division is getting to know what customers want. Analysis of the major market areas (residential, commercial, agricultural, and industrial) allows Hydro to develop market programs that support the strategy of wiser and wider use of electricity. A number of new customer needs have been identified, and marketing initiatives have been put into place.

In the industrial sector, work is underway to evaluate the market potential for electricity in industry. Case studies were completed during the year for customers in the abrasives, mining, metal melting, and pulp and paper industries. These studies concentrated on key applications such as heat treating, metal melting, and steam raising.



Tapping steam generating capacity at the Bruce Nuclear Power Development can offer Ontario industries an economic and reliable long-term source of industrial steam energy. The Bruce Energy Centre Development Corporation has been established to develop and market that potential. The assets of that Corporation were purchased by Ontario Hydro in June and funds were approved by the provincial government for the building of the steam delivery system to the Centre. Engineering of the steam delivery lines is in progress and a marketing plan is underway.

Better uses for electricity

Hydro continued to develop industrial applications for electrical energy. Solid state metering for in-plant energy measurements is providing our industrial customers with the means to improve the efficiency of their electricity use. Ontario Hydro's research activities have also developed Canadian standards for high-efficiency electric motors.

The philosophy underlying the Corporation's marketing efforts in the industrial sector is the recognition that low rates and high-efficiency electrical applications enable Ontario's industries to become more competitive.

In the residential sector, among the options available to customers are various dual heating systems. One of Hydro's "talking furnace" advertisements told customers how an electric plenum heater installed in an oil furnace could cut oil consumption and reduce heating bills.

Ontario Hydro continued to lend support and develop work on the super energy-efficient home.

Financial support to customers for conversions was identified as a need. Loans were made available to area and utility customers so they could spread their net conversion costs over a period of time on their electricity bills.

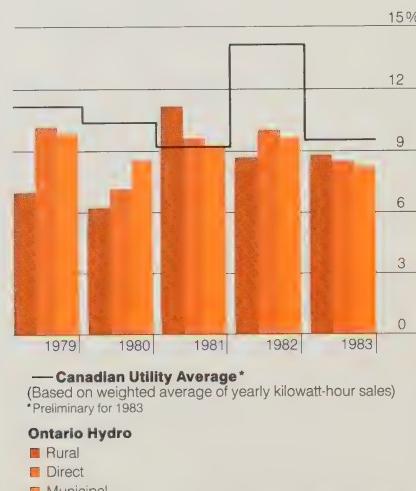
In 1983, activities in commercial and agricultural markets were focused on retrofitting buildings such as schools, offices, municipal and other government facilities, as well as hotels and motels. The Marketing Branch is now seeking opportunities for electrical energy in farming operations, new buildings, nursing homes, and multi-residence high-rise buildings.

Rates

The past decade has seen the cost of most forms of energy escalate rapidly. However, the average wholesale cost of electricity produced by Ontario Hydro since 1979 has actually declined by 2.2 per cent in real dollar terms.

In October, Hydro's Board of Directors approved an average rate increase of 7.8 per cent for 1984 - 8.0 per cent for the municipal utility group, 7.6 per cent for the direct customer group, and a net 7.5 per cent for the rural retail system. The rural rate increase takes into account \$45 million in assistance provided by all electricity consumers in the province to reduce the electric bills of year-round rural residential customers. The level of this assistance in 1983 was \$35 million. (In 1981, legislation was passed to reduce the difference between bills paid by the rural and urban residents to 15 per cent, based on a monthly consumption of 1,000 kilowatt-hours.)

Excluding local utility costs, Hydro's 1984 wholesale rate will mean an increase of less than \$3.00 on the typical monthly bill of a municipal utility residential customer. A typical rural customer will pay an increase of \$3.42 on his monthly bill.



There are a number of factors which affect the 1984 rate increase. The major one is the cost associated with bringing new nuclear generating capacity into service. While this puts upward pressure on rate increases over the short term, in the long term a real decline in electricity rates is forecast. Over the life of the station, the low fuelling costs of a nuclear station compared to coal more than offset the higher capital costs.

Another contributing factor is the increased cost of fuel, labour, and materials used in operating our facilities. Hydro is subject to the same inflationary trends that exist elsewhere. Consequently, these costs must be recovered through electricity rates.

Starting in 1984, there may be some periods when there is nuclear generating capacity surplus to system needs. Since nuclear plants have low operating costs, Hydro can make this nuclear energy available to Ontario customers under certain conditions at attractive rates.

Consequently, Hydro has introduced new rate classes on an experimental basis - intermittent and monthly blended. Although the rates for these new classes are lower than Hydro's firm power rates, they recover more than our incremental costs (such as fuel) and also make a contribution towards Hydro's fixed costs. The new classes were available beginning on April 1, 1984.

Monthly Residential Electric Bills* 1 000 kW.h JANUARY 1984

New York	176
Boston	134
Charlottetown	117
Detroit	109
Chicago	108
Tampa	91
Dallas	88
Birmingham	83
Los Angeles	83
Washington D.C.	76
Little Rock	76
Atlanta	73
Louisville	66
St. Louis	65
Halifax	65
St. John's	65
Tennessee Valley Authority	59
Fredericton	57
Ontario - Rural	54
Portland, Oregon	53
Calgary	50
Vancouver	48
Ontario - Municipal Electric Utility Average	47
Regina	41
Montreal	39
Winnipeg	34

*Expressed in Canadian dollars

Customer service

Electricity users in Ontario expect a high degree of service and reliability. The completion of major generating projects and transmission lines in the 1980s will help meet that expectation.

In the meantime, Hydro has continued to work with customers to improve the range of services satisfying customer needs.

An important development benefitting rural customers is a new tingle voltage filter. After two years of research and testing, Hydro's Customer Service and Research Divisions developed a filter which prevents tingle or stray voltage - caused by electrical equipment failure or improper grounding - from entering a farmer's livestock buildings.

Although not a widespread problem, tingle voltage may cause loss of milk production or reduced growth in livestock on affected farms. Hydro's solution has proven so effective and economical that other utilities have expressed an interest in developing similar devices.

The year 1983 also saw initiatives in parallel generation. Ontario Hydro and the provincial government encourage the private generation of electricity. Hydro is developing a general policy on the purchase of electricity from private generating sources. Provided that technical criteria for a safe interconnection with the provincial power grid are met, Ontario Hydro guarantees that it will buy electricity from private energy producers.

As Ontario Hydro's corporate strategy for the 1980s is implemented, emphasis within the Corporation has begun to shift from engineering and construction activities to service and marketing efforts.

This corporate realignment has resulted in a general reduction in the number of employees in response to declining workload in many parts of the organization. More than two-thirds of those employees whose jobs had been phased out during the past year and a half found, or were seeking, other positions within the Corporation by the end of 1983.

Attention is being focused on preparing the people of Hydro to deal with the organization's changing direction. This means matching the skills and experience of surplus employees with the jobs becoming available through normal attrition as well as corporate realignment.

As construction activities decline over the next several years, there will be a corresponding reduction in design and construction staff. At the same time, the increased emphasis on customer service will open up a number of opportunities.

In 1983, a special program that encouraged long-service employees to retire early without any significant financial disadvantage resulted in approximately 1,300 early retirements. This, in turn, created openings for surplus staff and other employees.

By the end of the year, Hydro employed 23,376 regular staff, a decrease of 1,870 from 1982.

The issue of surplus staff was also one of the primary concerns in the negotiations between the Corporation and its professional and supervisory staff. These negotiations produced an agreement that provides for more flexible placement of surplus employees.

Like all provincially regulated organizations, Ontario Hydro had to abide by the Inflation Restraint Act, 1982, which limited pay increases to 5 per cent during 1983.

Hydro's employees made their own contribution to restraint. Most staff took vacation time or leave without pay over the Christmas holiday period, which allowed Hydro to shut down all but essential services.

Hydro continued to lend full support to the Ontario Human Rights Code. A human rights training program familiarized supervisory staff with the code and its application in the workplace. In addition, two policies on illegal discriminatory practices and sexual harassment were widely publicized throughout the Corporation during the year.

The Corporation continued to devote attention to its Equal Opportunity Program. The objective of the program is to ensure that women have the same access to training and career advancement as men do, resulting in increased opportunities in executive, management, professional, technical, and trades jobs.

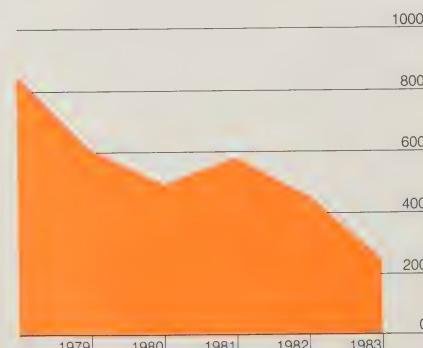
Health and safety

Employee and management achievements in occupational health and safety were impressive in 1983.

For the first time in more than 30 years, the staff worked an entire year without an on-the-job fatality. The time lost for work-related injuries dropped to 40 per cent of the previous five-year average, the lowest rate ever achieved.

Although within the realm of statistical variation, these results followed increased attention paid by managers and employees to the control of electrical contact and falling accidents – the predominant cause of fatal accidents among electrical utilities.

Hydro began a surveillance study of disease and mortality rates among all current and former employees involved in forestry since 1948. The results of this multi-year study should provide Hydro and other health officials with valuable data on the possible effects of chemical sprays that have been used in clearing rights of way. The use of herbicides does not, as far as is known, present a risk to either employees or the public. But Hydro is seeking further confirmation through this study that the spraying of herbicides is as safe as evidence to date suggests.



Time Lost for Work Related Injuries

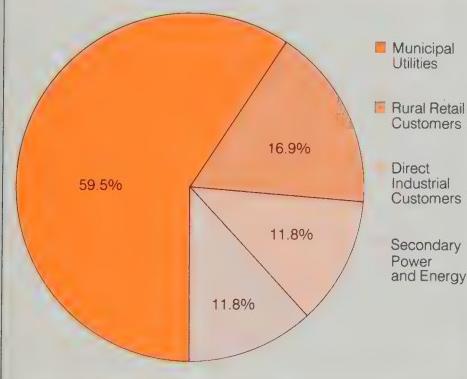
Days Lost per Million Employee Hours

Financial Review

Ontario Hydro's revenues in 1983 totalled \$3,805 million. Primary sales of electricity to customers in Ontario amounted to \$3,357 million, while secondary sales mainly to United States utilities totalled \$448 million in 1983. Primary revenues increased 13.1% or \$388 million over 1982 due to an 8.4% increase in power rates and a 4.7% increase in the volume of sales. The average increase in rates for municipal utilities was 8.2%, while the average rate increases for direct industrial customers and rural retail customers were 8.5% and 8.8%, respectively. The 1983 sales volume to municipal utilities, rural retail and direct industrial customers increased 5.2%, 3.1% and 6.8%, respectively, mainly due to weather related factors and economic recovery in 1983. Secondary revenues increased 7.1% or \$30 million largely due to a 10.3% increase in sales volume, partially offset by lower prices resulting from lower world oil prices and a highly competitive export market.

Source of Revenues in 1983

Total Revenues
\$3,805,131,000



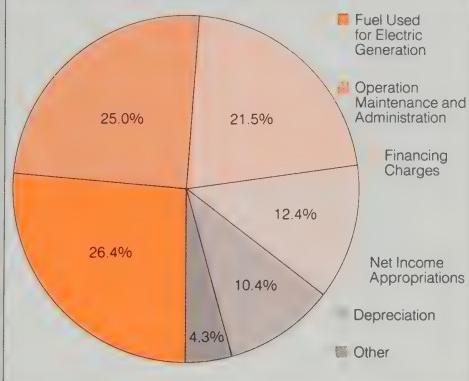
Ontario Hydro's total operating costs in 1983 amounted to \$3,333 million compared to \$3,039 million in 1982, an increase of 9.7%. Costs increased largely as a consequence of escalating prices for fossil fuels, and increased costs of labour, materials and purchased services.

Energy related costs comprised primarily of fuel and purchased power increased 6.9% over 1982. Electric energy generated by nuclear stations supplied 32% of total energy to the system in 1983. Hydraulic stations supplied 31% and higher cost fossil-fueled generation provided 30%. Purchases of power from interconnected utilities provided the remaining 7% of energy supplied to the system in 1983. The cost of fuel used for electric generation from all sources totalled \$1,006 million in 1983, an increase of \$104 million or 11.6% over 1982. This increase was primarily due to the higher cost of fossil-fueled generation and the increased volume of energy generated in 1983. Purchases of power in 1983 amounted to \$127 million, a decrease of \$1 million over 1982. Payments to Atomic Energy of

Canada Limited and the Province of Ontario, as required under the nuclear payback agreement, totalled \$37 million in 1983, a decrease of \$28 million from 1982. These payments decreased primarily because of the shut-down of Pickering units 1 and 2 as a consequence of the pressure tube failure in unit 2 on August 1, 1983.

Application of Revenues in 1983

Total Revenues
\$3,805,131,000



During 1983, costs associated with the operation, maintenance and administration of Ontario Hydro's in-service facilities amounted to \$952 million. The increase of \$98 million or 11.5% over 1982 was mainly due to the costs associated with a special retirement allowance program and escalation in labour and other costs, partially offset by an overall reduction in the level of operating and maintenance activities. As part of the effort to reduce staff levels, Ontario Hydro initiated, during 1983, a special retirement allowance program. Under this program, lump sum payments totalling \$53 million were made to approximately 1,300 long service employees who elected to take early retirement.

Depreciation costs charged to operations totalled \$395 million in 1983, an increase of \$48 million or 13.7% over 1982. This increase resulted primarily from additional facilities being placed in service, including Pickering Nuclear Generating Station unit 5. In addition, commencing in 1983, depreciation costs included a provision of \$19 million for the future removal of fuel channels in the first four units at the Pickering Nuclear Generating Station and the first three units at the Bruce Nuclear Generating Station.

Interest and foreign exchange costs charged to operations totalled \$816 million in 1983, \$73 million or 9.9% higher than 1982. These higher financing costs resulted from an \$88 million increase in interest costs charged to operations, partially offset by a \$15 million decrease in foreign exchange costs during the year. The increase in interest costs primarily resulted from financ-

ing costs associated with Pickering unit 5 being charged to operations in 1983 upon the unit being placed in service. The decrease in foreign exchange costs reflected the lower level of the Corporation's foreign debt repayable within one year, partially offset by the higher level of redemptions of foreign debt during 1983.

Net income for 1983 was \$472 million, \$123 million higher than in 1982. As required by the Power Corporation Act, \$185 million of net income was appropriated for debt retirement purposes in 1983. The remaining \$287 million balance of 1983 net income was appropriated to the Reserve for the Stabilization of Rates and Contingencies. The resulting improvements in the interest coverage and debt ratio indicators of Ontario Hydro's financial soundness are:

Financial Indicators	1983	1982
Interest Coverage	1.24	1.20
Debt Ratio	.840	.845

The funds required by Ontario Hydro to finance the construction of fixed assets were provided from two major sources, operations and long-term debt financing. In 1983, funds from operations provided \$912 million of Hydro's total requirements, while \$1,929 million was provided by long-term debt financing. Compared to 1982, these amounts were \$131 million higher and \$286 million lower, respectively.

Bonds, notes and other long-term debt issued by Ontario Hydro during 1983 totalled \$2,536 million. Canadian bonds and notes of \$1,200 million were issued during 1983. In addition, United States bonds and notes of U.S. \$603 million (Cdn. \$739 million) and Eurodollar bonds of U.S. \$450 million (Cdn. \$551 million) were issued, and an 80 million Swiss franc bond

issue (Cdn. \$46 million) was refinanced. The average coupon interest rate for long-term debt issued in 1983 was 10.9% compared to 14.6% in 1982. Maturing long-term debt amounted to \$426 million in 1983 compared to \$403 million in 1982. In addition, during 1983, an amount of \$182 million of debt was redeemed early compared to \$228 million in 1982.

Net additions to fixed assets were \$2,710 million during 1983. Major capital expenditures were \$2,437 million for generation facilities including \$325 million for heavy water, \$192 million for transmission and

Net Additions to Fixed Assets

\$ Millions



distribution facilities, and \$81 million for administration and service facilities. Net additions were \$173 million lower than those in 1982, the result of decreased expenditures of \$50 million on generation facilities, \$99 million on transmission and distribution facilities, and \$24 million on administration and service facilities. The expenditures on major generation projects under construction during 1983 and 1982 were:

1983 1982
\$ millions

Nuclear Generation

Bruce "B"	753	850
Pickering "B"	368	467
Darlington	698	381

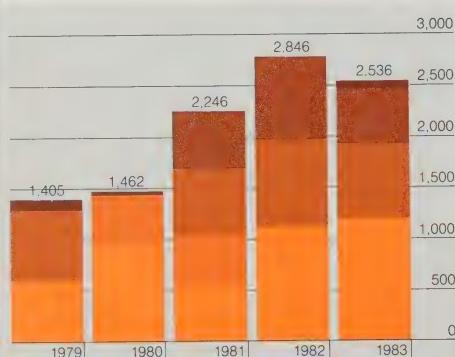
Fossil Generation

Atikokan	167	178
----------	-----	-----

During 1983, unit 5 at the Pickering Nuclear Generating Station was placed in service at a cost of \$1,123 million including \$159 million for heavy water.

Long-Term Debt Issued

\$ Millions



- Canadian Issues
- Canada Pension Plan Funds
- U.S. Issues
- Eurodollar Issues
- Other Long-Term Debt

Summary of Significant Accounting Policies

The accompanying financial statements have been prepared by management in accordance with generally accepted accounting principles in Canada which have been applied on a basis consistent with that of the preceding year. In management's opinion, the financial statements have been properly prepared within reasonable limits of materiality and in the light of information available up to March 12, 1984. To assist the reader in understanding the financial statements, the Corporation's significant accounting policies are summarized below:

Rate-setting

Ontario Hydro has broad powers to generate, supply and deliver electric power throughout the Province of Ontario. The Corporation operates under the Power Corporation Act and is subject to provisions of the Ontario Energy Board Act.

Under the provisions of the Power Corporation Act, the price payable by customers for power is the cost of supplying the power. Such cost is defined in the Act to include the cost of operating and maintaining the system, depreciation, interest, and the amounts appropriated for debt retirement and stabilization of rates and contingencies. The debt retirement appropriation is the amount required under the Act to accumulate in 40 years a sum equal to the debt incurred for the cost of the fixed assets in service. The appropriation for, or withdrawal from, the stabilization of rates and contingencies reserve is an amount established to maintain a sound financial position and to stabilize the effect of cost fluctuations.

Under the provisions of the Ontario Energy Board Act, a public hearing before the Ontario Energy Board is required in respect of any changes in electricity rates proposed by Ontario Hydro which affect its municipal utilities, direct industrial customers, or, if the Minister of Energy so directs, rural retail customers. The Ontario Energy Board submits its recommendations to the Minister of Energy. After considering the recommendations of the Ontario Energy Board, the Board of Directors of Ontario Hydro under the authority of the Power Corporation Act establishes the electricity rates to be charged to customers. If the Board of Directors specifies a certain cost or gain is to be included in future electricity rates, that would otherwise be charged or credited to operations in the current year, then this cost or gain is deferred and amortized to future operations on a basis consistent with its inclusion in rates.

Fixed assets

Fixed assets are capitalized at cost which is comprised of material, labour and engineering costs, as well as overheads, depreciation on service equipment and interest applicable to capital construction activities. In the case of generation facilities, cost also includes the net cost of commissioning, and for nuclear generation, the cost of heavy water. The net cost of commissioning is

the cost of start-up less the value attributed to energy produced by generation facilities during their commissioning period. The cost of heavy water is comprised of the direct cost of production, and applicable overheads, as well as interest and depreciation on the heavy water production facilities. Leases which transfer the benefits and risks of ownership of assets to Ontario Hydro are capitalized.

Interest is capitalized on construction in progress at rates (1983 - 14.0% and 1982 - 13.9%) which approximate the average cost of long-term funds borrowed in the years in which expenditures have been made for fixed assets under construction. If the construction period of a project is extended and the construction activities are continued, interest is capitalized during the period of extension provided that the project has a reasonable expectation of completion.

If a project is cancelled, or deferred indefinitely with a low probability of construction being resumed in the future, all costs, including the costs of cancellation, are written off to operations.

If fixed assets are mothballed for future use, the costs of mothballing are charged to operations.

Depreciation

The capital costs of fixed assets in service are depreciated on a straight-line basis. Depreciation rates for the various classes of assets are based on their estimated service lives, which are subject to periodic review. Changes in service life estimates are implemented on a remaining service life basis from the year the change can be first reflected in electricity rates. Major components of generating stations are depreciated over the lesser of the service life expectancy of the component or the remaining service life of the associated generating station.

The estimated service lives of assets in the major classes are:

Generating stations	
- hydraulic	- 65 to 100 years
- fossil	- 25 to 35 years
- nuclear	- 40 years
Heavy water	- over the period ending in the year 2040
Transmission and distribution	- 20 to 55 years
Administration and service	- 5 to 60 years
Heavy water production facilities	- 11 to 20 years

In accordance with group depreciation practices, for normal retirements the cost of fixed assets retired is charged to accumulated depreciation with no gain or loss being reflected in operations. However, gains and losses on sales of fixed assets, and losses on premature retirements are charged to operations in the year incurred as adjustments to depreciation expense.

When the net costs of removal on retirement of fixed assets can be reasonably estimated and are significant, the amounts are amortized to operations on an annuity basis over the remaining service life of the fixed assets. Other net removal costs are charged to operations as incurred. Net removal costs amortized to operations include the estimated costs of decommissioning nuclear stations and, commencing in 1983, the estimated costs of removing certain nuclear reactor fuel channels. Estimates of net removal costs, interest rates, and the amortization periods are subject to periodic review. Changes in estimated costs are implemented on a remaining service life basis from the year the changes can be first reflected in electricity rates.

Fixed assets removed from operation and mothballed for future use are amortized so that any estimated loss in value is charged to operations on a straight-line basis over their non-operating period.

Unamortized advances for fuel supplies

As part of its program to ensure the adequate supply of fuels for its generating stations, Ontario Hydro has entered into long-term fuel supply contracts. Where these contracts require Ontario Hydro to make payments for pre-production costs to suppliers in advance of product delivery, these payments and associated costs, including interest, are carried in the accounts as unamortized advances for fuel supplies. The advances are amortized to fuel inventory as the fuels are delivered.

Fuel for electric generation

Fuel used for electric generation is comprised of the average inventory costs of fuel consumed, charges for commissioning energy produced, and provisions for disposal of nuclear fuel irradiated during the period. The inventory cost of fuel consumed is comprised of fuel purchases, transportation and handling costs, and the amortization of advances for fuel supplies. Transportation costs include charges for interest and depreciation on railway equipment owned by Ontario Hydro. The charges for commissioning energy produced during the period represent the incremental operating and fuel costs of producing the same quantity of energy at generating units displaced because of the commissioning activity. The costs for disposal of nuclear fuel irradiated in each period are charged to operations based on estimated future expenditures and interest accumulating to the estimated date of disposal. Estimates of expenditures, interest rates, and the date of disposal are subject to periodic review. Adjustments resulting from changes in estimates are amortized to operations on an annuity basis over the period from the year the changes

can be first reflected in electricity rates to the estimated in-service date of the disposal facility.

Unamortized debt discount

Debt discounts or premiums arising on the issuance of debt are amortized over the period to maturity of the debt. In addition, redemption discounts or premiums on debt acquired prior to the date of maturity are amortized over the period from the acquisition date to the original maturity date of the debt.

Nuclear agreement – Pickering units 1 and 2

Ontario Hydro, Atomic Energy of Canada Limited and the Province of Ontario are parties to a joint undertaking for the construction and operation of units 1 and 2 of Pickering Nuclear Generating Station, with ownership of these units being vested in Ontario Hydro. Contributions to the capital cost by Atomic Energy of Canada Limited and the Province of Ontario amounted to \$258 million and these have been deducted in arriving at the value of fixed assets in service in respect of Pickering units 1 and 2. Ontario Hydro is required to make monthly payments until the year 2001 to each of the parties in proportion to their capital contributions. These payments, termed "payback", represent in a broad sense the net operational advantage of having the power generated by Pickering units 1 and 2 as compared with coal-fired units similar to Lambton units 1 and 2.

Foreign currency translation

Long-term debt payable in foreign currencies is translated to Canadian currency at rates of exchange at the time of issue. Current monetary assets and liabilities, including long-term debt payable within one year, are translated to Canadian currency at year-end rates of exchange and the resulting gains or losses, together with realized exchange gains or losses, are credited or charged to operations.

Pension plan

The pension plan is a contributory, defined benefit plan covering all regular employees of Ontario Hydro. Pension costs, as actuarially determined, include current service costs and amounts required to amortize any surpluses or unfunded liabilities. Commencing January 1, 1983, if there is a net surplus in the fund, it is amortized over five years or if there is a net unfunded liability arising from past service obligations it is amortized over fifteen years. Prior to 1983, surpluses and unfunded liabilities were amortized individually over fifteen years.

Research and development

Research and development costs are charged to operations in the year incurred, except for those related directly to the design or construction of a specific capital facility.

Statement of Operations

for the year ended December 31, 1983

	1983	1982
	\$'000	\$'000
Revenues		
Primary power and energy		
Municipal utilities	2,265,308	1,997,752
Rural retail customers	643,395	575,784
Direct industrial customers	448,007	395,250
	3,356,710	2,968,786
Secondary power and energy (note 1)	448,421	418,844
	3,805,131	3,387,630
Costs		
Operation, maintenance and administration	951,818	853,569
Fuel used for electric generation	1,006,306	902,089
Power purchased	126,420	127,519
Nuclear agreement – payback	37,311	65,334
Depreciation (note 2)	395,438	347,779
	2,517,293	2,296,290
Income before financing charges	1,287,838	1,091,340
Interest (note 3)	760,364	672,503
Foreign exchange (note 4)	55,823	70,418
	816,187	742,921
Net income	471,651	348,419
Appropriation for:		
Debt retirement as required by the Power Corporation Act	185,030	168,015
Stabilization of rates and contingencies	286,621	180,404
	471,651	348,419

See accompanying summary of significant accounting policies and notes to financial statements.

Statement of Financial Position

as at December 31, 1983

26

	Assets	1983	1982
		\$'000	\$'000
Fixed assets			
Fixed assets in service (note 5)		14,655,203	13,073,735
Less accumulated depreciation		3,606,410	3,186,729
		11,048,793	9,887,006
Construction in progress (note 5)		8,898,965	7,712,599
		19,947,758	17,599,605
Current assets			
Cash and short-term investments (note 6)		357,529	452,200
Accounts receivable		471,199	364,277
Fuel for electric generation (note 7)		759,360	801,842
Materials and supplies, at cost		191,122	199,489
		1,779,210	1,817,808
Other assets			
Unamortized advances for fuel supplies (note 8)		894,065	758,823
Unamortized deferred costs (note 9)		398,370	394,793
Unamortized debt discount		80,123	58,893
Long-term accounts receivable and other assets		94,368	90,910
		1,466,926	1,303,419
		23,193,894	20,720,832

See accompanying summary of significant accounting policies and notes to financial statements.

Liabilities	1983	1982
	\$'000	\$'000
Long-term debt		
Bonds and notes payable (note 10)	18,017,388	16,089,328
Other long-term debt (note 11)	222,920	241,159
	18,240,308	16,330,487
Less payable within one year	263,105	448,537
	17,977,203	15,881,950
Current liabilities		
Accounts payable and accrued charges	525,324	562,223
Short-term notes payable	26,270	112,949
Accrued interest	579,290	521,094
Long-term debt payable within one year	263,105	448,537
	1,393,989	1,644,803
Other liabilities		
Long-term accounts payable and accrued charges	166,086	80,753
Accrued irradiated fuel disposal and fixed asset removal costs (note 12)	147,648	75,644
	313,734	156,397
Contingencies (notes 5 and 13)		
Equity		
Equities accumulated through debt retirement appropriations	2,156,280	1,971,458
Reserve for stabilization of rates and contingencies	1,225,993	939,529
Contributions from the Province of Ontario as assistance for rural construction	126,695	126,695
	3,508,968	3,037,682
	23,193,894	20,720,832

On behalf of the Board

Wiley Nestich

Chairman

Vice-Chairman

Toronto, Canada,
March 12, 1984.

**Statement of Equities Accumulated through
Debt Retirement Appropriations**

for the year ended December 31, 1983

28

	Municipal Utilities	\$'000	Power District	Totals	
			(Rural Retail and Direct Industrial Customers)	1983	1982
			\$'000	\$'000	\$'000
Balances at beginning of year	1,381,573		589,885	1,971,458	1,803,662
Debt retirement appropriation	126,369		58,661	185,030	168,015
Transfers and refunds on annexations by municipal utilities	1,853		(2,061)	(208)	(219)
Balances at end of year	1,509,795		646,485	2,156,280	1,971,458

**Statement of Reserve for Stabilization
of Rates and Contingencies**

for the year ended December 31, 1983

	Held for the benefit of all customers	\$'000	Held for the benefit of (or recoverable from) certain groups of customers	Totals	
			Rural Customers	Direct Industrial Customers	1983
			\$'000	\$'000	\$'000
Balances at beginning of year	948,127		1,144	(9,565)	(177)
Appropriation	288,843		136	(1,494)	(864)
Transfers and recoveries on annexations by municipal utilities	(78)		—	57	—
Payment to Ontario Municipal Electric Association (note 14)	—		(136)	—	(136)
Balances at end of year	1,236,892		1,144	(11,002)	(1,041)
					1,225,993 939,529

See accompanying summary of significant accounting policies and notes to financial statements.

Statement of Changes in Financial Position

for the year ended December 31, 1983

	1983	1982
	\$'000	\$'000
Source of funds		
Operations		
Net income	471,651	348,419
Charges not requiring funds in the current year:		
Depreciation	395,438	347,779
Provision for irradiated fuel disposal costs	40,450	56,708
Other	4,716	28,225
	912,255	781,131
Financing		
Long-term debt		
Bonds and notes payable and other long-term debt issued	2,536,490	2,845,624
Less retirements	607,872	631,490
	1,928,618	2,214,134
Short-term notes payable – (decrease) increase	(86,679)	15,749
Cash and short-term investments – decrease (increase)	94,671	(43,759)
	1,936,610	2,186,124
Accounts payable and accrued interest – increase	21,297	207,386
Long-term accounts payable and accrued charges – increase	85,333	14,267
Fuel, materials and supplies – decrease (increase)	53,222	(160,203)
	3,008,717	3,028,705
Application of funds		
Net additions to fixed assets (note 15)	2,709,542	2,883,039
Unamortized advances for fuel supplies – increase	135,242	161,999
Accounts receivable and other assets – increase (decrease)	163,933	(16,333)
	3,008,717	3,028,705

See accompanying summary of significant accounting policies and notes to financial statements.

Notes to Financial Statements

30

1. Secondary power and energy

Secondary power and energy is comprised mainly of revenues of \$447 million in 1983 (1982 - \$418 million) from sales of electricity to United States utilities.

2. Depreciation

	1983	1982
	\$'000	\$'000
Depreciation of fixed assets in service	477,979	452,189
Amortization of deferred costs	16,723	15,508
Amortization of net removal costs	31,000	14,000
Other net removal costs	8,634	7,508
	534,336	489,205
Less:		
Depreciation charged to - heavy water production	110,892	108,754
- construction in progress	25,446	23,733
- fuel for electric generation	2,373	2,387
Gain on sales of fixed assets	187	6,552
	138,898	141,426
	395,438	347,779

Depreciation of fixed assets in service includes \$26 million (1982 - \$15 million) for the amortization of non-operating generating units which have been mothballed. (See note 5.)

3. Interest

	1983	1982
	\$'000	\$'000
Interest on bonds, notes, and other debt	1,999,763	1,702,607
Interest on accrued irradiated fuel disposal and fixed asset removal costs	12,245	4,936
	2,012,008	1,707,543
Less:		
Interest charged to - construction in progress	966,345	758,622
- heavy water production	123,869	127,042
- unamortized advances for fuel supplies	68,799	53,792
- fuel for electric generation	34,796	28,116
Interest earned on investments	57,835	67,468
	1,251,644	1,035,040
	760,364	672,503

4. Foreign exchange

	1983	1982
	\$'000	\$'000
Exchange loss on redemption and translation of foreign long-term debt	54,204	66,317
Net exchange loss on other foreign transactions	1,619	4,101
	55,823	70,418

5. Fixed assets

	1983		
	Assets in Service	Accumulated Depreciation	Construction in Progress
	\$'000	\$'000	\$'000
Generating stations - hydraulic	1,776,229	482,715	41,885
- fossil	2,833,986	894,816	546,357
- nuclear	3,021,025	437,289	6,695,329
Heavy water	752,534	96,576	1,302,056
Transmission and distribution	4,153,281	1,000,971	251,300
Administration and service	757,821	306,895	58,662
Heavy water production facilities	1,360,327	387,148	3,376
	14,655,203	3,606,410	8,898,965
	1982		
	Assets in Service	Accumulated Depreciation	Construction in Progress
	\$'000	\$'000	\$'000
Generating stations - hydraulic	1,755,915	452,953	26,404
- fossil	2,797,302	804,473	392,697
- nuclear	1,950,220	366,665	5,878,047
Heavy water	594,007	85,984	1,028,890
Transmission and distribution	3,953,425	932,118	297,825
Administration and service	667,011	268,271	65,384
Heavy water production facilities	1,355,855	276,265	23,352
	13,073,735	3,186,729	7,712,599

On August 1, 1983, the unit 2 reactor at the Pickering Nuclear Generating Station was shut down when heavy water began leaking from the heat transport system. The leak was traced to a cracked pressure tube. As part of an investigation, the Pickering unit 1 reactor, the "sister" of unit 2, was shut down on November 14, 1983, for inspection and metallurgical testing of a sample of its reactor pressure tubes. On March 12, 1984, Ontario Hydro's Board of Directors decided to replace the pressure tubes in units 1 and 2 prior to restarting these units. Retubing of the two units is expected to be completed by 1987. Electricity demand for both primary and secondary customers will be met by Ontario Hydro's other sources of generation.

An initial assessment of the financial implications arising from the pressure tube failure and the retubing has been completed. Preliminary indications of the impact on the capital construction program and operations are that for the period 1984 to 1992, capital costs, excluding interest capitalized, are expected to increase approximately \$200 million (1984 dollars) and revenue requirements are expected to increase approximately \$280 million (1984 dollars) over amounts previously forecast for this period.

Eight units (1982 - five units) at the R. L. Hearn Generating Station, four units (1982 - four units) at the Lennox Generating Station and two units at the J. C. Keith Generating Station are mothballed. The capital cost and accumulated depreciation of these non-operating fossil-fueled units, amounting to \$701 million and \$276 million, respectively (1982 - \$562 million and \$162 million, respectively), are included in fixed assets in service. At this time it is uncertain if, or when, these units will resume operation.

The remaining two units at the J. C. Keith Generating Station, one unit at the Thunder Bay Generating Station, and Bruce Heavy Water Plant "A" are expected to be mothballed in 1984. The capital costs and accumulated depreciation of these facilities, amounting to \$305 million and \$248 million, respectively, are included in fixed assets in service.

5. Fixed assets (continued)

Construction in progress at December 31, 1983 is comprised of:

	Remaining Number of Units Scheduled	Planned In-Service Dates	Dependable Capacity to be Placed in Service	Costs Incurred to December 31, 1983	Estimated Costs to Complete (Excluding Escalation and Interest)
			MW	\$ millions	\$ millions
Nuclear generating stations (including heavy water)					
Pickering "B"	3	1984-85	1,548	2,234	140
Bruce "B"	4	1985-87	3,124	4,057	830
Darlington	4	1988-92	3,524	1,477	4,360
Fossil generating station					
Atikokan	1	1984	206	531	60
All other construction in progress	—	—	—	600	—
				8,899	

The above estimates are the most recent forecasts. These estimates exclude cost escalation and interest which are forecast to average 7.8% and 12.8% per year, respectively, over the period 1984 to 1992. Because of the uncertainties associated with long construction lead times and planned in-service dates, these costs to complete are subject to change.

6. Cash and short-term investments

	1983 \$'000	1982 \$'000
Cash and interest bearing deposits with banks and trust companies	329,297	431,459
Corporate notes	5,000	5,278
Government and government-guaranteed securities	23,232	15,463
	357,529	452,200

Corporate notes were recorded at cost which approximates market value. Government and government-guaranteed securities were recorded at the lower of cost or market value; market value as at December 31, 1983 was \$23 million (1982 - \$17 million).

7. Fuel for electric generation	1983	1982
	\$'000	\$'000
Inventories – coal	462,296	590,268
– uranium	293,992	200,177
– oil	3,072	11,397
	759,360	801,842

8. Unamortized advances for fuel supplies	1983	1982
	\$'000	\$'000
Coal	94,499	113,010
Uranium	799,566	645,813
	894,065	758,823

Based on present commitments, additional advance payments for fuel supplies will total approximately \$57 million over the next five years, including approximately \$12 million in 1984.

9. Unamortized deferred costs	1983	1982
	\$'000	\$'000
Bruce Heavy Water Plant "D"	352,470	353,393
Wesleyville Generating Station	45,900	41,400
	398,370	394,793

Bruce Heavy Water Plant "D"

Bruce Heavy Water Plant "D" is an indefinitely deferred project with a low probability of construction being resumed in the future. The Board of Directors has specified that the capital cost of this project be amortized at an annual rate of 4% in 1983, and the unamortized cost as at January 1, 1984 be amortized for recovery through rates at an annual rate of 10% over the period 1984 to 1993.

Wesleyville Generating Station

The value of the remaining assets of the Wesleyville Generating Station project has been reduced by \$46 million. The Board of Directors has specified that this cost be amortized for recovery through rates at an annual rate of 10% over the period 1984 to 1993.

10. Bonds and notes payable

Bonds and notes payable, expressed in Canadian dollars, are summarized by years of maturity and by the currency in which they are payable in the following table:

Years of Maturity	1983			1982		
			Principal Outstanding \$'000	Weighted Average Coupon Rate		
	Canadian	Foreign			Total	Weighted Average Coupon Rate
1983	—	—	—		428,647	
1984	99,278	143,641	242,919		210,974	
1985	485,100	291,722	776,822		855,095	
1986	150,000	146,989	296,989		145,982	
1987	717,957	199,911	917,868		920,698	
1988	849,262	285,927	1,135,189		—	
1 – 5 years	2,301,597	1,068,190	3,369,787	11.2%	2,561,396	10.8%
6 – 10 years	550,940	3,189,775	3,740,715	12.6	2,809,698	12.9
11 – 15 years	989,113	399,353	1,388,466	8.2	1,043,321	8.1
16 – 20 years	2,515,622	568,673	3,084,295	11.9	3,102,444	11.3
21 – 25 years	1,581,405	1,933,108	3,514,513	9.7	2,715,613	9.5
26 – 30 years	1,286,240	1,633,372	2,919,612	12.8	3,856,856	11.5
	9,224,917	8,792,471	18,017,388	11.3	16,089,328	11.0
Currency in which payable:						
Canadian dollars			9,224,917		8,314,524	
United States dollars			8,669,928		7,653,712	
West German Deutsche marks			50,993		64,368	
Swiss francs			71,550		56,724	
			18,017,388		16,089,328	

Bonds and notes payable in United States dollars include \$5,792 million (1982 – \$5,108 million) of Ontario Hydro bonds held by the Province of Ontario and having terms identical with Province of Ontario issues sold in the United States on behalf of Ontario Hydro. All bonds and notes payable are either held, or guaranteed as to principal and interest, by the Province of Ontario.

Bonds and notes payable in foreign currencies are translated into Canadian currency at rates of exchange at time of issue. If translated at year-end rates of exchange, the total amount of these liabilities would have to be increased by \$925 million at December 31, 1983 (1982 – \$848 million).

11. Other long-term debt	1983	1982
	\$'000	\$'000
The balance due to Atomic Energy of Canada Limited for the purchase of Bruce Heavy Water Plant "A". Under the purchase agreement, Ontario Hydro pays equal monthly instalments of blended principal and interest to December 28, 1992, with interest at the rate of 7.795%.	163,666	175,835
Capitalized lease obligation for the head office building at 700 University Avenue, Toronto. The lease obligation is for the 30-year period ending September 30, 2005, payable in United States dollars at an effective interest rate of 8%.	40,666	41,310
Capitalized lease obligations for transport and service equipment. Under these agreements, monthly instalments of principal and interest will be paid to 1988, at effective interest rates ranging from 6.8% to 12%.	18,588	24,014
	222,920	241,159

Payments required on the above debt, excluding interest, will total \$100 million over the next five years. The amount payable within one year is \$20 million (1982 - \$20 million).

12. Accrued irradiated fuel disposal and fixed asset removal costs	1983	1982
	\$'000	\$'000
Accrued irradiated fuel disposal costs	110,229	60,669
Accrued fixed asset removal costs	37,419	14,975
	147,648	75,644

Irradiated fuel disposal costs

Studies have been carried out to estimate the costs to be incurred for the disposal of irradiated nuclear fuel. The significant assumptions used in estimating the future irradiated fuel disposal costs were:

- an in-service date of the year 2000 for irradiated nuclear fuel disposal facilities;
- a transportation distance of 1,600 kilometres from nuclear generating facilities to disposal facilities; and
- interest and escalation rates through to the disposal date averaging 13.1% and 9.2% (1982 - 9.2% and 7.3%), respectively.

Because of the uncertainties associated with the technology of disposal and the above factors, these costs are subject to change.

Fixed asset removal costs

Studies have been carried out to estimate the costs of decommissioning nuclear generating stations after the end of their service lives, and also the costs of removing certain fuel channels expected to be replaced during their service lives. The significant assumptions used in estimating decommissioning costs were:

- decommissioning on the deferred dismantlement basis (dismantlement following storage with surveillance for a 30 year period after shutdown of the reactors);
- a transportation distance of 1,600 kilometres from nuclear generating facilities to disposal facilities; and
- interest and escalation rates through to the completion of decommissioning averaging 11.0% and 8.5% (1982 - 8.0% and 6.6%), respectively.

The significant assumptions used in estimating the fuel channel removal costs were:

- removal of fuel channels in Pickering NGS "A" units 1 to 4 and Bruce NGS "A" units 1 to 3 in the 1994 to 2006 period; and
- interest and escalation rates through to 2006 averaging 13.2% and 8.3%, respectively.

Because of the uncertainties associated with the technology of decommissioning and fuel channel removal, and the above factors, these costs are subject to change. As a consequence of the Pickering unit 2 pressure tube failure, the timing and costs of removal of fuel channels in Pickering units 1 and 2 are being revised (see note 5). The impact of these changes will not be included in costs until the changes can be reflected in rates in 1985.

13. Fuel used for electric generation

Ontario Hydro contracted with Petrosar Limited for the purchase of 20,000 barrels of residual fuel oil per day through to April 1992. Deliveries for the years 1981 and 1982 were 6% and 2%, respectively, of the contract quantities. No deliveries were taken during 1983. Amounts have been charged to the costs of operations in prior years to provide for settlement with respect to reduced deliveries up to and including 1982. Ontario Hydro advised Petrosar Limited on May 24, 1983 that the contract is at an end due to Petrosar's prior undertaking to the Government of Canada to limit its production of residual fuel oil to an amount less than the contracted quantities. Petrosar has commenced actions claiming damages of \$45.5 million and \$59.9 million for failure to take the contract quantities in 1981 and 1982, respectively. Ontario Hydro has counterclaimed for \$39.4 million paid to Petrosar Limited in 1980, 1981 and 1982 and an accounting for the difference between market and contract prices for residual fuel oil supplied since the date of such undertaking. The result of these actions and counterclaims and the rights of Petrosar Limited under the contract are not determinable.

14. Payment to Ontario Municipal Electric Association

The amount of this payment is equivalent to interest on the balance held for the benefit of Municipal Utilities in the Reserve for Stabilization of Rates and Contingencies.

15. Net additions to fixed assets

Net additions to fixed assets are capital construction expenditures less the proceeds on sales of fixed assets. The proceeds on sales of fixed assets in 1983 and 1982 were insignificant. For 1984, net additions to fixed assets are estimated to be approximately \$2,700 million.

16. Pension plan

The most recent actuarial valuation of Ontario Hydro's pension plan as at December 31, 1982 reported a surplus of approximately \$16 million (December 31, 1981 - \$28 million).

The significant actuarial assumptions used in the 1982 valuation (1981 valuation) were:

- rate used to discount future investment income 8.5% (1981 - 8.5%) and future benefits 8% (1981 - 8%);
- salary escalation rate 8% (1981 - 8%);
- average retirement age for males 61.2 (1981 - 61.4) and for females 60.7 (1981 - 61.3); and
- common stocks valuation 5 year average (1981 - 5 year average).

Additional unfunded liabilities of approximately \$54 million for plan improvements, partially offset by the experience surplus for 1982 of approximately \$42 million, decreased the pension plan surplus by \$12 million.

The pension plan costs for 1983 were \$73 million (1982 - \$70 million).

17. Research and development

In 1983, approximately \$58 million of research and development costs were charged to operations and \$4 million were capitalized (1982 - \$61 million and \$5 million, respectively).

Auditors' Report

**To the Minister of Energy and to the
Board of Directors of Ontario Hydro:**

We have examined the statement of financial position of Ontario Hydro as at December 31, 1983 and the statements of operations, equities accumulated through debt retirement appropriations, reserve for stabilization of rates and contingencies and changes in financial position for the year then ended. Our examination was made in accordance with generally accepted auditing standards, and accordingly included such tests and other procedures as we considered necessary in the circumstances.

In our opinion, these financial statements present fairly the financial position of Ontario Hydro as at December 31, 1983 and the results of its operations and the changes in its financial position for the year then ended in accordance with generally accepted accounting principles applied on a basis consistent with that of the preceding year.

Toronto, Canada,
March 12, 1984.

CLARKSON GORDON
Chartered Accountants

Five Year Summary of Financial Statistics

38

	1983	1982	1981	1980	1979
(in thousands of dollars)					
Revenues					
Primary power and energy					
Municipal utilities	2,265,308	1,997,752	1,800,129	1,603,072	1,441,557
Rural retail customers	643,395	575,784	545,760	513,616	474,795
Direct industrial customers	448,007	395,250	391,038	341,785	305,210
Secondary power and energy	3,356,710	2,968,786	2,736,927	2,458,473	2,221,562
	448,421	418,844	424,581	360,742	346,558
	3,805,131	3,387,630	3,161,508	2,819,215	2,568,120
Costs					
Operation, maintenance and administration	951,818	853,569	764,712	639,572	601,422
Fuel used for electric generation	1,006,306	902,089	765,429	674,085	608,615
Depreciation	395,438	347,779	324,596	305,967	284,610
Other	163,731	192,853	190,720	148,528	151,651
	2,517,293	2,296,290	2,045,457	1,768,152	1,646,298
Income before financing charges and extraordinary item					
	1,287,838	1,091,340	1,116,051	1,051,063	921,822
Financing charges					
Gross interest	2,012,008	1,707,543	1,369,933	1,165,921	1,029,568
Capitalized interest	(1,193,809)	(967,572)	(627,758)	(401,254)	(341,073)
Investment income	(57,835)	(67,468)	(84,685)	(109,268)	(105,163)
	760,364	672,503	657,490	655,399	583,332
Foreign exchange	55,823	70,418	51,743	19,238	70,875
	816,187	742,921	709,233	674,637	654,207
Income before extraordinary item					
Extraordinary item	—	—	—	160,000	—
Net income	471,651	348,419	406,818	216,426	267,615
(in thousands of dollars)					
Financial position					
Total assets	23,193,894	20,720,832	17,829,621	15,593,347	14,513,729
Fixed assets	19,947,758	17,599,605	15,447,525	13,630,177	12,628,842
Long-term debt	17,977,203	15,881,950	13,662,582	12,005,058	11,134,185
Equity	3,508,968	3,037,682	2,689,653	2,284,277	2,069,538
(in thousands of dollars)					
Major sources of funds					
Operations	912,255	781,131	751,019	692,377	582,424
Bonds and notes payable and other long-term debt – net increase	1,928,618	2,214,134	1,716,204	862,249	1,098,025
Major application of funds					
Net additions to fixed assets	2,709,542	2,883,039	2,144,210	1,469,550	1,574,716
Unamortized advances for fuel supplies – net increase	135,242	161,999	182,719	146,722	126,680
Financial indicators					
Interest coverage ⁽³⁾	1.24	1.20	1.30	1.32	1.26
Debt ratio ⁽⁴⁾	.840	.845	.841	.846	.848
Return on average rate base (%) ⁽⁵⁾	12.0	11.4	11.3	10.8	10.1

1983 1982 1981 1980 1979

(in cents per kilowatt-hour of total energy sales)

Average revenue⁽¹⁾

Primary power and energy

Municipal utilities	3.210	2.981	2.710	2.470	2.276
Rural retail customers	5.027	4.475	4.269	3.970	3.649
Direct industrial customers	2.740	2.614	2.290	2.080	1.937
Secondary power and energy	3.768	3.895	3.838	3.363	2.972
All classifications combined	3.409	3.203	2.945	2.685	2.475

(expressed as a %)

Average rate increases

Municipal utilities	8.2	9.6	9.3	8.6	9.8
Rural retail customers	8.8	8.7	11.2	6.2	7.0
Direct industrial customers	8.5	10.0	9.6	7.1	10.1

(in cents per kilowatt-hour of energy generated)

Average cost⁽¹⁾⁽²⁾

Hydraulic

Operation, maintenance and administration	.159	.173	.149	.109	.098
Fuel – water rentals	.077	.073	.066	.058	.052
Depreciation and financing charges	.348	.360	.351	.324	.326
	.584	.606	.566	.491	.476

Nuclear

Operation, maintenance and administration	.491	.487	.411	.349	.332
Fuel – uranium	.357	.384	.232	.239	.194
Depreciation and financing charges	1.026	.883	.807	.765	.926
	1.874	1.754	1.450	1.353	1.452

Fossil

Operation, maintenance and administration	.368	.402	.374	.342	.327
Fuel – coal, gas and oil	2.417	2.328	2.097	1.856	1.708
Depreciation and financing charges	.669	.683	.611	.645	.715
	3.454	3.413	3.082	2.843	2.750

Footnotes

(1) Figures for 1983 are preliminary.

(2) Average cost per kilowatt-hour represents the costs attributable to generation but excludes the costs related to transmission, distribution and corporate administrative activities. These figures reflect the historical accounting costs of operating facilities and the actual energy generated by these facilities during the year.

(3) Interest coverage represents income before extraordinary item plus interest on bonds, notes, and other debt divided by interest on bonds, notes, and other debt.

(4) Debt ratio represents debt (bonds and notes payable, short-term notes payable, other long-term debt, and accrued irradiated fuel disposal and fixed asset removal costs) divided by debt plus equity.

(5) Return on average rate base represents income before extraordinary item plus gross interest divided by average rate base (total assets less long-term and current accounts payable and accrued charges, accrued interest, and contributions from the Province of Ontario as assistance for rural construction).

Comparative Statistics

40

	1983	1982	1981	1980	1979
Customer statistics⁽¹⁾		(in millions of kilowatt-hours)			
Primary energy sales					
Municipal utilities	70,579	67,019	66,416	64,899	63,349
Rural retail	12,798	12,867	12,783	12,936	13,011
Direct industrial	16,330	15,119	17,077	16,432	15,757
	99,707	95,005	96,276	94,267	92,117
Secondary energy sales	11,900	10,753	11,063	10,727	11,662
		(in thousands)			
Total Ontario customers:					
Residential	2,597	2,559	2,528	2,493	2,449
Farm	108	110	110	112	113
Commercial and industrial	343	335	329	322	316
	3,048	3,004	2,967	2,927	2,878
		(in kilowatt-hours per customer)			
Average annual use:					
Residential	10,200	9,976	9,852	9,821	9,839
Farm	21,389	21,135	20,731	19,978	19,225
Commercial and industrial	200,200	194,376	204,575	202,582	204,113
		(in cents per kilowatt-hour)			
Average revenue:					
Residential	4.67	4.34	3.96	3.60	3.22
Farm	4.87	4.50	4.11	3.74	3.42
Commercial and industrial	3.52	3.28	2.92	2.66	2.35
Operating statistics					
Dependable peak capacity ('000 kW) ⁽²⁾	25,269	24,906	24,595	24,457	24,429
December primary peak demand ('000 kW)	18,792	16,872	16,600	16,808	16,365
Primary energy made available ('000,000 kW•h)	106,071	100,836	101,659	100,174	98,127
Total Staff, average for year	31,233	32,654	30,850	28,902	28,385

Footnotes

(1) Figures for 1983 are preliminary.

(2) Includes mothballed generation: 1983 – 3,783,200 kW; 1982 – 3,034,200 kW; 1981 – 1,913,000 kW; 1980 – 1,704,000 kW; and 1979 – 550,000 kW.

Ontario Hydro

Board of Directors

Mr. J. A. Gordon Bell, Thornhill
Vice-Chairman, Ontario Hydro
Deputy Chairman, President and
Chief Operating Officer,
Bank of Nova Scotia

Arthur J. Bowker, Ottawa
Senior Research Officer
National Research Council

Alan B. Cousins, Wallaceburg
Former President
Ideal Stampings Limited

John B. Cronyn, London
Director
John Labatt Limited

A. Ephraim Diamond, Toronto
Deputy Vice-Chairman, Ontario Hydro
President, Whitecastle Investments Limited

John W. Erickson, Q.C., Thunder Bay
Barrister and Solicitor
McKittrick, Erickson, Jones, Shanks

Isobel Harper, Toronto
Vice-President, W. H. Harper Inc.

Albert G. Hearn, Agincourt
Former Vice-President
Service Employees International Union

***Hugh L. Macaulay**, Toronto
Chairman, Ontario Hydro

****Milan Nastich**, Toronto
Chairman and President, Ontario Hydro

O. John C. Runnalls, Toronto
Chairman
Centre for Nuclear Engineering
and Professor of Energy Studies
University of Toronto

Leonard N. Savoie, Sault Ste. Marie
President and Chief Executive Officer
Algoma Central Railway

William A. Stewart, London
Farmer and Former Minister
of Agriculture for Ontario

Officers:

****Chairman of the Board
and President**
Milan Nastich

***Chairman of the Board**
Hugh L. Macaulay

Vice-Chairman
J. A. Gordon Bell

Deputy Vice-Chairman
A. Ephraim Diamond

Senior Executive Vice-President
Patrick G. Campbell

Executive Vice-Presidents

Arvo Niitenberg
Operations
E. H. (Ted) Burdette
Planning and Administration
Sam G. Horton
Engineering and Services

Vice-Presidents

Ron W. Bartholomew
Finance
L. A. (Vern) Coles
Regions
C. S. (Cliff) Elliott
Human Resources
H. Allen Jackson
Production
John G. Matthew
Supply and Services
Dane B. MacCarthy
Marketing
Lorne G. McConnell
Power System Program
William G. Morison
Design and Construction
J. B. (Jim) Smith
Corporate Relations

Secretary and General Counsel

William E. Raney, Q.C.

**Assistant Secretary
and Deputy General Counsel**
Lawrence E. Leonoff

Treasurer
Dirk Peper

Corporate Comptroller
Ian R. Russell

Regional Directors

Central Region

H. K. (Hal) Wright
5760 Yonge Street
Willowdale M2M 3T7

Eastern Region

P. J. (Phil) Garlough
420 Dundas Street East
Belleville K8N 5C3

Georgian Bay Region

F. A. (Al) Perttula
93 Bell Farm Road
Barrie L4M 1H1

***Niagara Region

J. W. H. (Bill) Kerr
Box 157, 1053 Main Street West
Hamilton L8N 3B9

Northeastern Region

C. G. (Gord) Sanford
590 Graham Drive
North Bay P1B 8L4

Northwestern Region

J. D. (Jack) Hamer
34 Cumberland Street North
Thunder Bay P7A 4L5

Western Region

Dr. David A. Drinkwater
1075 Wellington Road
London N6E 1M1

Committees of the Board of Directors

Finance

M. Nastich (Chairman)
J. A. G. Bell
A. J. Bowker
A. E. Diamond
L. N. Savoie

Audit

A. E. Diamond (Chairman)
I. Harper (Vice-Chairman)
A. J. Bowker
A. B. Cousins
J. B. Cronyn
A. G. Hearn
M. Nastich

Management Resources

J. A. G. Bell (Chairman)
A. J. Bowker
J. B. Cronyn
M. Nastich
O. J. C. Runnalls
L. N. Savoie
W. A. Stewart

Social Responsibility

A. J. Bowker (Chairman)
A. B. Cousins
J. W. Erickson
I. Harper
A. G. Hearn
W. A. Stewart

Technical Advisory

O. J. C. Runnalls (Chairman)
A. J. Bowker
J. W. Erickson
M. Nastich

*Retired March 31, 1983

**Appointed Chairman April 1, 1983

***Closed June 30, 1983 and responsibilities
assumed by Central and Western Regions

CA 2 ON
EP
A55

Ontario Hydro

1984 Annual Report



Contents	Page
Financial Highlights	1
Message from the Chairman	3
The Economic Environment	4
Message from the President	5
Public Power at Cost:	
The Founding Principle	6
1984 In Review	9
Preparing for Future Needs	23
Financial Section	25
Comparative Statistics	48



Ontario Hydro
 Head Office, 700 University Avenue,
 Toronto M5G 1X6

Cover: The Toronto shoreline, yesterday and today. Fifty years separate the two views of the city from Toronto Islands. In the mid-1930s, when the city population was 629,000, the electrical demand of the greater urban area was 230,604 kilowatts. The modern metropolis has a population of about 2.25 million and requires close to 15 times that amount.

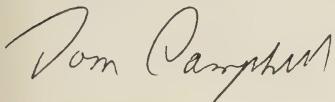
Report of the Board of Directors of Ontario Hydro for the Year 1984

To:

The Honourable George L. Ashe,
Minister of Energy

We, the Board of Directors, submit to you this report of the financial position and relevant Ontario Hydro activities for the year 1984. We would like to thank you and the staff of the Ministry of Energy for the cooperation and understanding extended during the year.

On behalf of the Board



Tom Campbell, Chairman
April, 1985

Financial Highlights

	1984	1983
	millions of dollars	
Revenues	4,212	3,805
Net income	575	472
Total assets	27,301	23,194
Investment in fixed assets	2,624	2,746

The Corporation

Ontario Hydro is a corporation without share capital created by a special statute of the Province of Ontario in 1906. It now operates under the authority of the Power Corporation Act, R.S.O. 1980, Chapter 384, as amended, with broad powers to generate, supply and deliver electric power throughout the province. It is also authorized to produce and sell steam and hot water as primary products. The Corporation's prime objective is to supply the people of Ontario with electricity at the lowest feasible cost consistent with high safety and quality of service standards.

Ontario Hydro's main activity is wholesaling electric power to municipal utilities in urban areas, who in turn retail it to customers in their service areas. Ontario Hydro also serves directly more than 100 large industrial customers and 779,746 rural retail customers in areas or communities not served by municipal utilities. In 1984, approximately 3,108,000 customers were served by Ontario Hydro and the municipal utilities in the province.

Ontario Hydro operates 80 hydraulic, fossil and nuclear generating stations and an extensive power grid across Ontario to meet the province's demands for electric energy. Interconnections with other systems place the Corporation in an extensive electrical grid that covers a large segment of the North American continent.

In addition, Ontario Hydro exercises certain regulatory functions over municipal utilities and also exercises the approval and inspection functions for electrical equipment (in conjunction with the Canadian Standards Association) and electrical wiring installations throughout the province.

Ontario Hydro is a financially self-sustaining corporation. The Province of Ontario guarantees bonds and notes issued to the public by the Corporation.

Ontario Hydro's head office is located at 700 University Avenue, Toronto, Ontario. For administrative and operational purposes, six regional and 51 area offices are maintained throughout the province.

The business and affairs of Ontario Hydro are directed and controlled by a board of directors consisting of a chairman, a president, a vice-chairman, and not more than 10 other directors. All of the members of the board are appointed by the Lieutenant Governor in Council of the province except the president who is a full-time employee of the Corporation appointed by the Board.

To assist the Board in directing the Corporation's affairs, there are five Committees of the Board - Finance, Audit, Management Resources, Social Responsibility, and Technical Advisory. These committees review and make recommendations to the Board on matters within their terms of reference.

Message from Tom Campbell, Chairman

Today, Ontario enjoys one of the most cost-effective electrical systems in the world. As the producer of most of the Province's electricity, Ontario Hydro recognizes that its major responsibility lies in keeping electricity rates competitive.

Hydro's corporate goal of no real increase in the price of electricity for the decade of the 1980s guarantees electricity's place in the provincial economy as a competitive, reliable, efficient energy source.

Behind Hydro's founding mandate of "power at cost" was a recognition that development of a domestic energy source was fundamental to the province's future. Then, as now, Ontario could not afford to rely on foreign fuel markets.

If prudence and foresight demanded energy independence, independence, in turn, demanded financial commitment: secure investment of capital in return for a long-term supply of low-cost power.

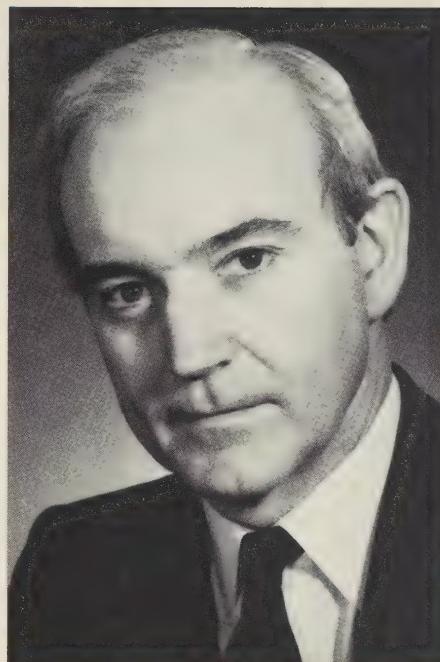
That sound management strategy led to the construction in 1917 of one of Hydro's greatest success stories - Niagara Falls' Sir Adam Beck I generating station. That same strategy is at work today in the building of the Pickering, Bruce, and Darlington nuclear stations.

These new facilities, when complete, will save the Ontario economy \$1 billion per year. That's how much more it would cost if we were to generate the power they will produce with coal-fired plants instead.

Providing Ontario with energy self-sufficiency is no mean achievement. Ontario is a highly industrialized province, with a cold climate and virtually no indigenous sources of oil, natural gas, or coal. If Ontario is to continue to grow, to remain industrially competitive, and to provide jobs for our people, Hydro must ensure an ample and reliable supply of power for the future.

To that end, we are currently reviewing all demand and supply options - traditional sources such as nuclear and coal-fired stations, as well as small hydraulic plants, co-generation, conservation, purchased power, and a wide variety of alternative technologies.

Meeting the challenges of the future involves making the best possible use of our resources. That includes putting to use the



skills and dedication of Hydro employees - who are responsible for Hydro's reputation for technological excellence, leadership, and high-quality customer service.

At this time, I would like to extend a special thanks to Hydro President Milan Nastich, who served as Chairman for a great part of 1984. Under his guidance the Corporation successfully passed through a time of considerable challenge. In his current position Milan Nastich remains of great personal help to me.

I would also like to extend thanks to the Board of Directors, in particular William Stewart and Arthur Bowker, who retired from the Board in the spring of 1985. Their wise counsel, and that of all Board members, is much appreciated.

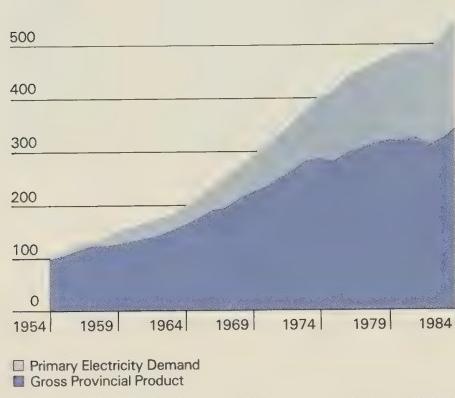
Hydro is also fortunate to have the support and cooperation of the municipal electrical utilities. Since the beginning of the Hydro system, the municipal utilities have been a key factor in ensuring that our service remains in the best interest of customers. The utilities have been ably represented by their two associations, the Ontario Municipal Electric Association and the Association of Municipal Electrical Utilities.

The Economic Environment

As the provincial utility serving Canada's most heavily industrialized province, Ontario Hydro has had to respond to the major turnaround in economic activity that took place over the past two years.

Ontario continued its strong recovery from the deep recession of 1981-82, and over the past two years recorded the second highest economic growth (next to Nova Scotia) among Canadian provinces. The major contributor to Ontario's recovery was a strong automotive sector. Capital-goods-producing industries such as machinery production also posted a significant recovery during the year and are expected to benefit from the steady improvement in capital spending now forecast.

Electricity Demand and Economic Growth in Ontario
(Index 1954 = 100)



The province continued to play a leading role in Canada's international trade. Ontario's exports to the United States in 1984 increased significantly from 1983 to over \$50 billion. The automotive sector was largely responsible for this increase, but considerable gains were also recorded in capital goods and other markets. The United States continues to be Ontario's largest export market, and Ontario continues to be Canada's leading supplier of goods and services to the U.S., accounting for more than half of Canada's total exports to that country.

Accompanying the increase in economic activity was a decrease in inflation. As it did nationally, inflation in Ontario dropped in 1984. Ontario's inflation rate of 4.8 per cent was the lowest it has been in more than a

decade. While this was a welcome development for Ontario consumers, some of this decline must be attributed to high unemployment, which has caused a slowdown in the rate of wage increases. By the end of the year, a decline in the growth of demand for consumer goods was evident.

In general, the Canadian economy has made a significant recovery, expanding by almost 4 per cent beyond its pre-recession peak of 1981. Much of this growth is recovery from previous lows. But utilities must recognize that the economy still has room to grow.

Manufacturing plant utilization rates are still well below capacity (except in the pulp and paper and automotive sectors), and continuing high levels of unemployment across Canada indicate underutilization of the work

Hydro Prices vs. Inflation
(Index 1954 = 100)



force. The demand for electricity has picked up rapidly over the past two years and, with the potential for further economic growth, economic indicators point to a continued increase in the demand for electrical energy.

Message from Milan Nastich, President

The quality of life in the Province of Ontario depends to a significant extent on a supply of electric energy which is both reliable and economic.

During 1984, the staff of Ontario Hydro worked hard to assure the people of Ontario of just such a supply - first, by continuing to build the new facilities needed to ensure that electricity remains economic and reliable, and second, by increasing our emphasis on the qualities of responsiveness, flexibility, and efficiency needed to satisfy our customers.

Hydro has gone through a significant transition in recent years. The economic pressures of the last decade - OPEC, declining energy demand, high interest and inflation rates - could only be overcome by changing the way we do business.

To help us change our way of doing business, a new corporate strategy was implemented in 1982 and a new Mission Statement published in 1984. With these guides, Hydro has been able to reposition itself in the energy market and work toward achieving the needed responsiveness, flexibility and reasonable pricing of electricity.

Both the Province and Ontario Hydro went through difficult times in 1982, and decisive actions taken during that year laid the groundwork for better times in 1983 and 1984.

For the future, we have shown the skill and resilience needed to continue the successes of 1984. As in the past, we remain committed to assuring the people of Ontario of reliable and economic electricity.

I'd like to add a word of thanks to the 23,000 people across the Province who work at Hydro. The Corporation's success is wholly due to their contribution and dedication. They offer service Ontario can count on.



PUBLIC POWER AT COST: THE FOUNDING PRINCIPLE

Ontario Hydro was established as The Hydro-Electric Power Commission of Ontario in 1906. Its creation by the provincial government was a direct response to widespread public demands for a reliable electricity supply to be made available at cost wherever and whenever needed.

The action by the legislature followed a decade of campaigning by an alliance of a dozen Ontario cities and towns, supported by boards of trade, manufacturers' associations, and the votes of local ratepayers. They demanded solutions to two problems that limited the province's ability to grow and prosper – an increasingly serious drain on the economy caused by the need to import millions of tons of Pennsylvania coal to generate electricity; and the high pricing policies and fragmented, inadequate services of the private power companies of the day.

The fires of enthusiasm for a cooperative public power system and municipal control of distribution had been lighted in places like Toronto, Berlin (Kitchener), Preston, Hespeler, Galt, and Guelph. The flames were fanned

across the province by Adam Beck, a cigar box manufacturer and former mayor of London, who became Hydro's first chairman.

Two technological breakthroughs of the late 19th century – development of water power generators and high-voltage long-distance transmission lines – had brought within reach the dream of unlocking the energy of Niagara Falls and other waterways. Moving water, one of Ontario's most abundant and readily available natural resources, could provide power for all at a fraction of the cost of imported coal – but not without capital borrowing on a scale that required the financial strength of the province as a whole.

From these beginnings evolved a unique system – a centralized utility responsible for electrical generation and transmission, balanced by a decentralized delivery network of independently elected or appointed municipal hydro-electric commissions.

Beginning with 14 municipal partners, Ontario Hydro built its first transmission lines from Niagara Falls, delivering power

Hydro extended and consolidated the benefits of inexpensive hydro-electric power during the first two decades of the century. The demand by consumers for electrically powered appliances and labour-saving devices helped establish new manufacturing and service industries across the province.



from private generating stations to Kitchener and London by 1910, and to Toronto by 1911. Today, though Ontario Hydro has 316 municipal partners, the form of the partnership remains the same. The municipal utilities still buy bulk power from Hydro at cost and retail it to approximately two and a half million customers through their distribution assets of \$2.5 billion.

The original objectives of Ontario Hydro – energy self-sufficiency and the competitive advantages of reliable energy supplied at cost – have also remained constant. This mandate has been a major advantage in the industrial and economic development of Ontario. It required the relatively rapid evolution of today's Ontario Hydro: a corporation supplying reliable, low-cost electrical energy from three fuel sources – falling water, coal, and uranium.

"You say our work is done," said Adam Beck on completion of the first transmission lines from Niagara Falls in 1911. "I say that it has only begun. We must deliver power to such an extent that the poorest working man will have light in his home."

Two years later, when Hydro's first generating plant was placed in service on the Severn River, Beck explained the developing rural policy of Ontario Hydro in a few words: "We want the loneliness of the farm removed and its burdens shaken off."

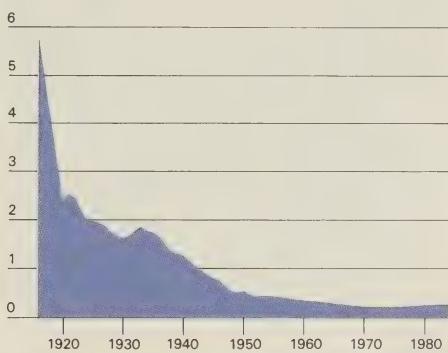
By 1917, the demand of war industries for increasing amounts of electricity had resulted in province-wide power shortages. Again, Ontario found it necessary to turn to coal imports to close the gap.

The situation precipitated a change of lasting significance in Hydro's original mandate. The utility was empowered to issue its own bonds under provincial guarantee. This amendment gave Hydro access to the borrowing power of the province as a whole. It provided the means as well as the authority to direct and develop one of the world's largest and most successful public utilities. At the same time, the provincial government approved Hydro's proposal to build the largest hydro-electric generating station in the world.

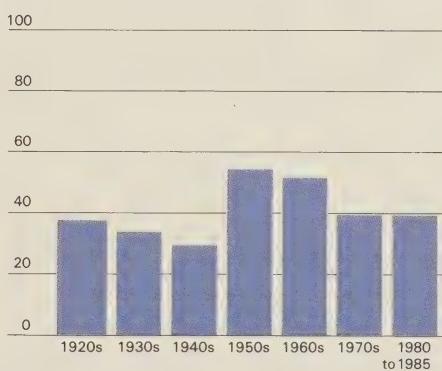
The Sir Adam Beck I generating station, downstream from Niagara Falls at Queenston Heights, was a landmark achievement in financial planning as well as engineering.

Construction costs were very high for the

Minutes Worked per kW.h in Ontario
1916 – 1984



Ontario Hydro Debt
as a % of Total Ontario Debt



period – more than \$80 million – but the benefits have continued to the present day. Last year, the station produced power at well under one cent a kilowatt-hour.

The project was almost completely debt-financed, establishing a principle that remains fundamental to Hydro policy today. It is the principle that debt incurred for a major generating station should be repaid largely by the beneficiaries of the power it produces, that is, out of future revenues from sales of electrical energy.

The Beck station was the forerunner of such megaprojects as the St. Lawrence Seaway and Power Development of the 1950s and today's nuclear generating program – which involved financial backing by the province.

The Sir Adam Beck I generating station demonstrated conclusively that power can be produced and delivered at very low long-term unit costs through debt-financed, capital-intensive projects beyond the borrowing power of individual regional utilities.

Such an approach has worked in the province's best economic interests. The amount of time an Ontario resident must work to pay for his or her electricity has been falling steadily for 60 years. The rise in electricity prices in Ontario has been significantly slower than the rise in prices of almost all other goods and services. Today, Hydro's debt represents about 40 per cent of the province's total indebtedness. This is about the same as it was in the 1920s, and somewhat lower than in the 1950s and 1960s.

The development of Ontario's water resources continued until the demand for power outstripped the number of available sites. With completion of the St. Lawrence power project in the 1950s, most of the economic hydro-electric sites had been developed. Hydro had begun to build coal-fired generating stations. History was repeating itself. The province was once more being forced to rely on coal imports over which it could exercise little or no control.

This reliance continued to grow until development of the CANDU reactor in the 1960s

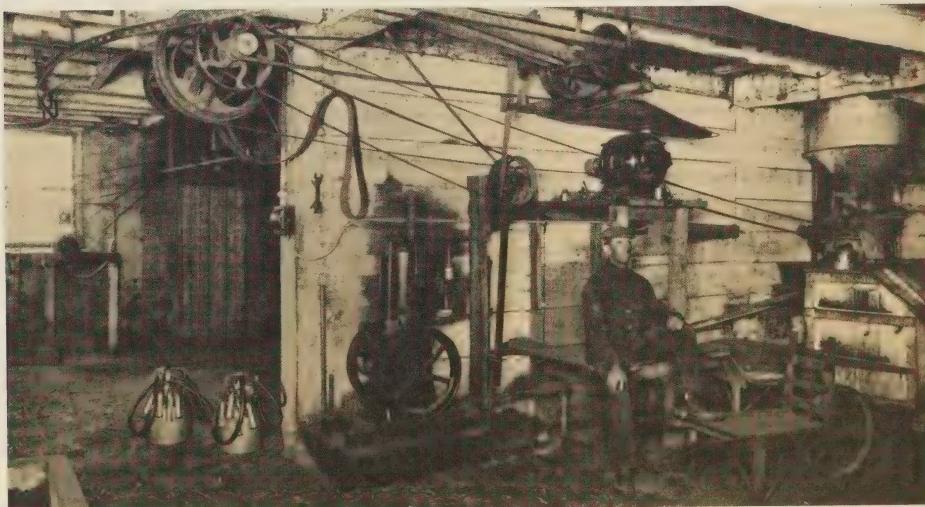


Power from Sir Adam Beck I hydro-electric station began flowing into the system from the Niagara River on December 29, 1921. During construction, the world's largest hydraulic generating station was criticized as unnecessary and uneconomic. Today, it produces power at six-tenths of a cent per kilowatt hour.

demonstrated that electricity could again be produced from a virtually inexhaustible Ontario resource: uranium.

Ontario decided to develop nuclear energy for essentially the same reasons that prompted creation of Ontario Hydro in the first place: economics and self-sufficiency. Again, the choice was capital-intensive generating stations, financed largely through debt, with repayment assigned to future customers and spread over the life of the stations. This strategy assures Ontario electricity users of a continuing supply of low-cost energy.

The belt-and-pulley technology may have been primitive by today's standards, but electricity helped release the farm worker from the drudgery of repetitive hand labour and long hours.



Energy Production

As has been the case throughout the century, the province's increased economic activity stimulated an increased demand for electrical energy by Ontario industries, businesses, and residents.

Ontario Hydro responded by supplying 122.9 billion kilowatt-hours of electricity in 1984 to meet provincial and export demands. Total primary energy demand was 112.3 billion kilowatt-hours, an increase of 5.9 per cent over 1983, despite an extremely mild December, one that was four degrees Celsius warmer on average than the previous year's. Most of the growth in demand was due to increased industrial activity. The year's peak demand of 18.9 million kilowatts occurred on January 12, surpassing the previous year's peak of 18.8 million kilowatts.

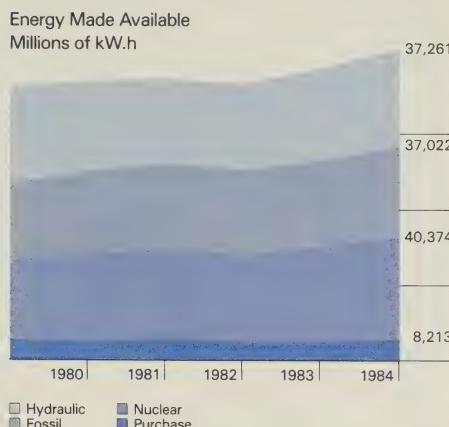
Ontario Hydro has the most diversified generating system of any utility in Canada. Over the years, the Corporation has planned its system by developing the kind of generating stations that give the best combination of economic performance, use of provincial energy sources, and flexibility.

Today, Hydro relies almost equally on hydro-electric, nuclear, and fossil-fuelled sources. The relative contribution of nuclear energy will increase in future years as new stations (mostly nuclear) come into service.

This change in generation mix will be gradual, but it is already reflected in 1984 production figures. In 1984, nuclear generating stations produced 40.4 billion kilowatt-hours. This represents 32.8 per cent of the total energy supplied in the year (compared with 32.5 per cent in 1983).

The additional output of two new nuclear units contributed to this increase, more than offsetting the loss of production caused by Pickering units 1 and 2 being out of service all year for retubing. The new units were Pickering unit 6, declared in service in February, and Bruce unit 6, which went into service in mid-September.

In May, Atomic Energy of Canada Limited (AECL) removed from service its Douglas Point nuclear station. This plant had served as the prototype for Hydro's larger Pickering and Bruce stations. Since 1967, Hydro had operated Douglas Point and purchased the power it produced, but separate reviews by AECL and



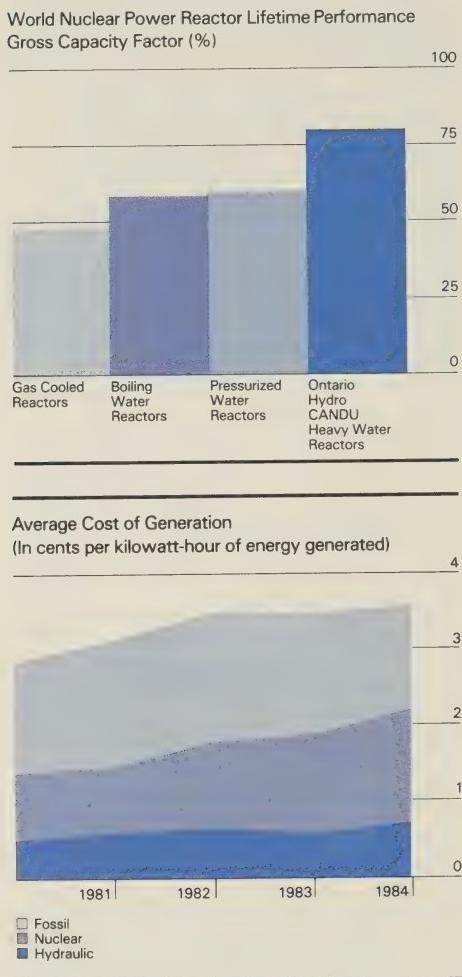
Ontario Hydro concluded that it was no longer economic to operate the station.

The impressive performance of Ontario Hydro's CANDU-design nuclear stations continued to justify the heavy investment made in them. Due to their very low fuelling costs and high degree of reliability, these nuclear plants produced reliable electrical energy at an average cost of 2.2 cents per kilowatt-hour during the past year.

The Bruce A generating station had an exceptional year, with all four 750-megawatt reactors operating at over 90 per cent of their potential capacity. Bruce A achieved a capacity factor of 93.8 per cent, a record unmatched by any other multi-unit station in the world. The four operating units at the Pickering A and B stations also had a good performance record for the year, finishing at between 78 and 87 per cent of their potential.

On a lifetime basis, five of Hydro's CANDU units rank in the top ten in world-wide performance comparisons. In 1984, even with two units at Pickering being out of operation, Hydro's CANDU plants finished with an impressive capacity factor of 76 per cent. This is considerably higher than other types of nuclear plant design.

From early in the century, the Corporation's hydraulic generating stations have been the basis for the province's low-cost electricity. Over the last decade, nuclear power has been taking on more of that role. Both nuclear and



hydro-electric continue to be of immense economic importance to Ontario because of their ability to produce power continuously with high reliability at very low operating costs.

The province's major hydro-electric sites have already been developed, but hydraulic generation continues to supply almost one-third (30.3 per cent) of Hydro's production - 37.3 billion kilowatt-hours in 1984. The average cost of hydraulic power in 1984 was 0.7 cents per kilowatt-hour, a figure that reflects very low operating costs and low depreciation on older plants.

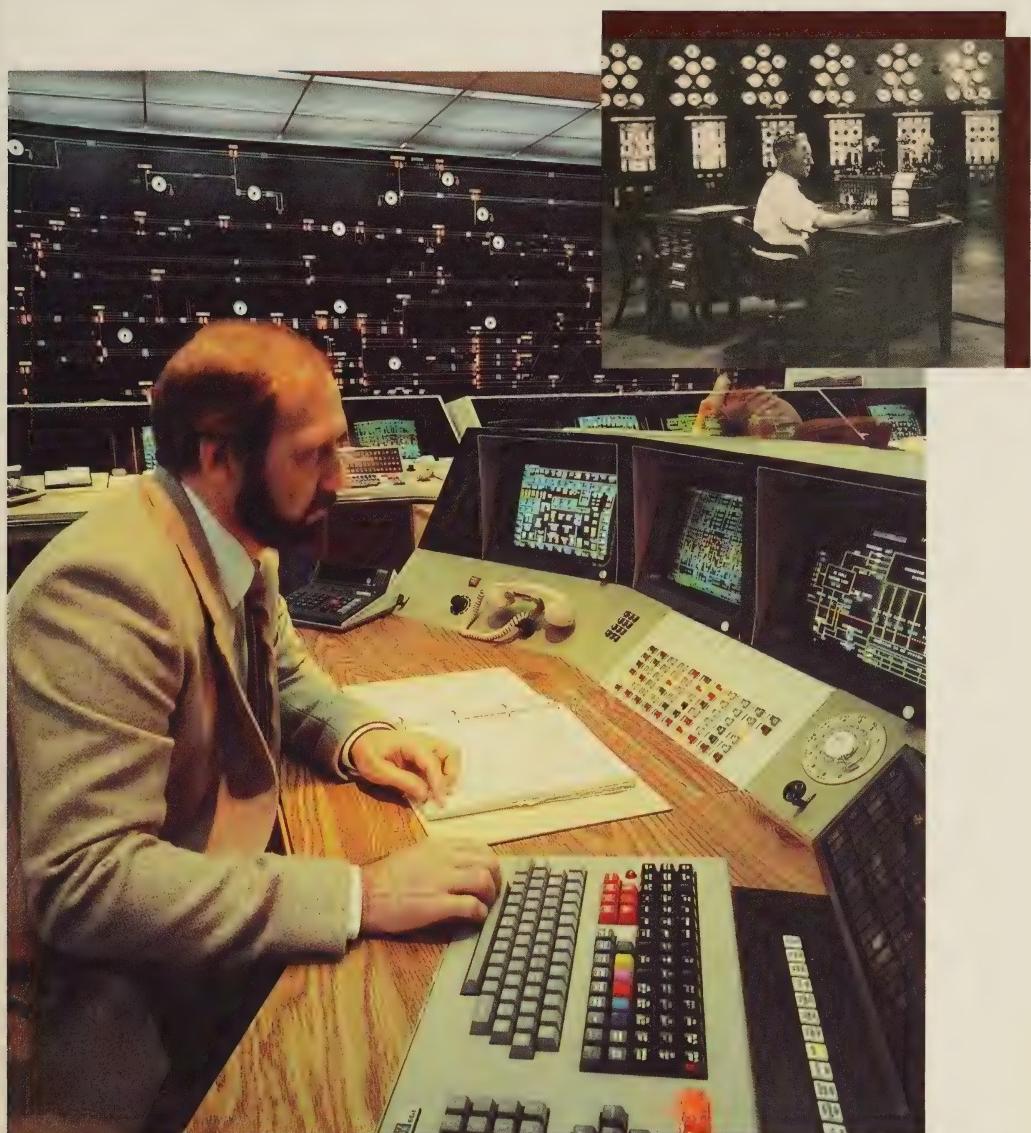
The third type of generation that Ontario Hydro relies on is fossil-fuelled plants. The coal-fired generating stations in Hydro's system are more expensive to operate than hydraulic or nuclear plants. In 1984, they produced electricity at an average cost of 3.4 cents per kilowatt-hour.

In spite of their higher operating costs, fossil-fuelled stations make a valuable contribution during periods of the day or of the year when demand for power is high. Unlike nuclear and larger hydraulic stations, which are designed to run continuously, coal-fired stations can be quickly started up and shut down. They thus give flexibility to adjust to fluctuations in demand due to weather changes or other unusual load conditions.

Fossil-fired generation was down in its proportion of total energy produced. These stations contributed 37.0 billion kilowatt-hours of electricity in 1984. Although this was an increase over the 35.8 billion produced in 1983, it represented 30.2 per cent of total production compared with 30.4 per cent the previous year.

Each type of generation makes its own type of contribution to meeting the province's energy needs. But not all units in the system continue to be equally valuable. Keeping the system efficient and responsive means recognizing not only the economics of each station, but also environmental impact, the use of indigenous resources, and overall system needs. Thus over the last couple of years some of the older and less efficient coal-fired units have been retired from service.

Following completion at the beginning of the year of a power export contract with General Public Utilities, the remaining two units



Computers and a high-speed electronic information network make it possible today to balance power generation and transmission throughout the system from a single location - the Richview Control Centre. Computers and electronics have greatly reduced the need for round-the-clock monitoring by operators at individual stations (inset).

of the older J. Clark Keith station were scheduled to be taken out of service. This was delayed until March to ensure that the needs of Ontario customers were met during the winter period of high demand.

Another one of Hydro's coal-fired units, Thunder Bay unit 1, was taken out of service

during the year. Similar plans for two additional units at the Lakeview generating station near Toronto were deferred. All eight Lakeview units were kept in service following the decision to retube two units at Pickering. This retubing will require units 1 and 2 to remain out of service until 1986 and 1987 respectively.

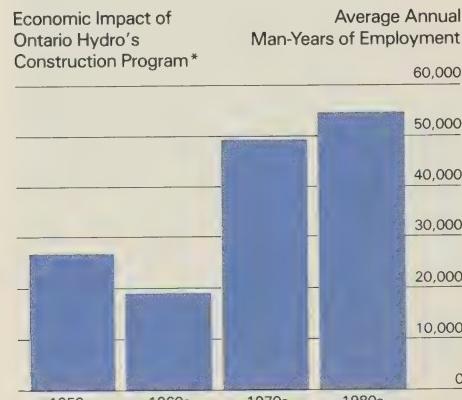
Hydro's Contribution to the Ontario Economy

Through the years, the growth of Ontario Hydro has paralleled that of the province. Not only has Hydro supplied the low-cost energy needed by industries to compete and expand, it has also provided each year many thousands of construction jobs for Ontario tradesmen and millions of dollars worth of business to Ontario contractors and manufacturers.

Hydro's direct construction spending over the past three and a half decades has contributed an annual average of \$1.3 billion (in 1984 dollars) to the provincial economy. This represents 1.2 per cent of the average annual gross provincial product.

In 1984, Ontario Hydro took delivery of about \$910 million worth of goods and services, and awarded another \$816 million in new contracts. Roughly 85 per cent of these new orders were placed with Canadian companies. The majority of these companies are located in Ontario.

Even these figures barely suggest the huge and beneficial economic impact on communities located near Hydro's construction sites. In Atikokan, for instance, construction of the



*This includes direct and indirect employment generated in Ontario by Hydro's construction program.

new coal-fired plant has created over 2,500 man-years of employment. The spin-off benefits from Hydro and worker spending have undoubtedly helped the town of Atikokan recover and plan for the future after its largest employer, an iron mine, shut down in the mid-1970s.

Construction

At the end of 1984, Ontario Hydro had nine nuclear units and one coal-fired station under construction. The nuclear units include two at the Pickering and four at the Darlington generating stations, all relatively close to Toronto on the shore of Lake Ontario, and three units at Bruce on the shore of Lake Huron. The coal-fired station under construction is at Atikokan in the northwest part of the province.

These new units were all planned during the 1970s. Along with units already in operation, they will enable the province to meet the electrical energy needs of a growing economy into the late 1990s.

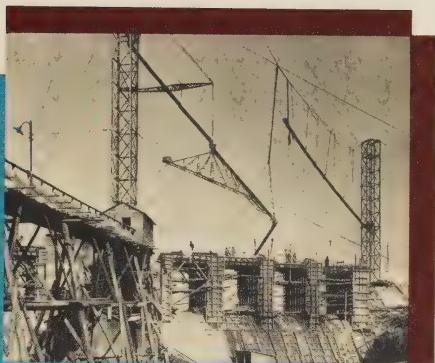
Bruce unit 5 was granted a licence to operate at full power in mid-December, only five weeks after it first produced power, and is scheduled to begin full service in April 1985. Pickering unit 7 began producing in November, and began full service on January 1, 1985.

Pickering unit 6 began service in February 1984, and Bruce 6 in September. Both units have performed extremely well since their in-service dates, which indicates a high level of quality in commissioning procedures.

These in-service dates were achieved despite a five-month strike by the International Brotherhood of Electrical Workers. The strike, which was settled in September, had little effect on the units under construction at Pickering and Bruce, which remain either on or ahead of schedule.

The new Darlington units were affected, however. There was a late start on the mechanical and electrical programs, and a delay in the calandria installation on unit 2. These delays are not expected to affect previously established in-service dates.

The station most affected by the electricians' strike was the new Atikokan coal-fired plant. This 200-megawatt station is now scheduled to go into service in July instead of January 1985.



Ontario Hydro pioneered work on the quality control and scientific mixing of concrete for hydro-electric dams, such as the Cameron Falls plant on the Nipigon River in 1921 (inset). This long tradition of excellence in building materials continues at the Darlington nuclear generating station. Hydro used slip forms and continuous concrete pouring to erect the outer shell of the vacuum building.

Pickering Retubing

Beyond a doubt, one of the highlights of 1984 has been the progress made on the retubing of Pickering units 1 and 2.

In the summer of 1983, a pressure tube ruptured in unit 2 at Pickering, and it was clear that this tube would have to be replaced. The replacement of small numbers of tubes had been carried out before, and would not have posed an unusual technical challenge.

However, testing of the failed tube in unit 2 at Pickering showed deterioration in the metal (Zircaloy-2) of which it was made. This suggested that some of the other tubes made of the same material might also fail. Instead of

replacing the tube and returning the reactor to service, Hydro decided to carry out a large-scale pressure tube replacement for units 1 and 2 at Pickering, the two oldest commercial nuclear units in Hydro's system, and the only two that use tubes made of Zircaloy-2.

When pressure tubes are replaced in a reactor that has been in operation, one of the first problems is to reduce the level of radioactivity. Working in conjunction with Atomic Energy of Canada Limited, Hydro staff developed a decontamination process that reduced radiation at the reactor face by 85 per cent. This process is so successful that it is being mar-

This tube extraction machine is one of the new tools and techniques developed for retubing work at the Pickering nuclear generating station. Rehabilitation work is more complex in the nuclear era, but the tradition of extending the service life of generating stations goes back to the rigorous inspection procedures and rehabilitation work at hydro-electric stations in the 1920s (inset).



keted under licence by an Ontario firm to other utilities in North America and abroad.

Before work was begun on replacing tubes, Hydro staff were trained on a full-scale mock-up reactor. By completely familiarizing staff with the procedures to be used, this training reduced the amount of time workers would have to spend on the real reactor.

Investigation of the tube failure revealed that special springs holding the tubes apart had moved, and would have to be realigned. To do this, an electromagnetic means of repositioning the springs in new units coming on stream was developed and proved to be a success. Development continues on a method for repositioning springs in units already in operation.

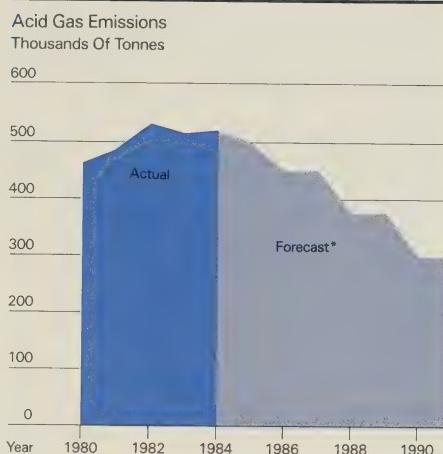
The retubing of Pickering units 1 and 2 has progressed smoothly and ahead of schedule. It has also contributed to the understanding of the effects of radiation on metals, and to the technical ability to decontaminate materials and reduce radiation in reactor repair and modification work. The complete success of the project to date has been due to the creativity, persistence, and sound project management of Hydro's staff.

Protecting the Environment

The creation of Ontario Hydro and the evolution of its electricity system over the years were based on the principles of improved energy independence for the province, and stable and reasonable electricity rates. Those factors have contributed substantially to the economic development of Ontario.

But Ontario Hydro recognizes that economic development must be consistent with protection of the natural and social environment of the province.

One environmental problem is acid rain. Ontario Hydro realizes that because it is part of the problem, it must be part of the solution. The burning of coal emits sulphur dioxide and nitrogen oxide gases into the air. These "acid gases" contribute to the formation of acid rain. While Ontario Hydro's contribution to the acid rain falling on sensitive regions of Ontario is small, Hydro recognizes that it must take steps to lower emissions.



*The forecast line shows the decreasing maximum allowable limits for Hydro's acid gas emissions. Actual emissions must be lower than the line, and in some years may be considerably lower.

In 1981, Hydro announced that it would reduce emissions of acid gas to 450,000 tonnes beginning in 1986, and to 300,000 tonnes in 1990. This represented reductions of close to 50 per cent from anticipated levels.

In 1984, the Corporation went further in its reduction program, and set itself targets of 500,000 tonnes in 1985, and 375,000 tonnes in 1988 and 1989.

Ontario Hydro also announced a pilot project to test a new "scrubber" technology that will reduce acid gas emissions. The \$2.4 million test project calls for the installation of a dry limestone injection system on one of the 300-megawatt units at the Lakeview coal-fired station in Mississauga. This technology involves injecting dry pulverized limestone directly into the boiler of the unit.

The new scrubber has the potential to reduce sulphur dioxide emissions by 40 to 50 per cent, and nitrogen oxide emissions by 20 to 30 per cent. Should the project prove successful, the technology could be fitted to larger units as necessary.

In the meantime, Hydro will continue to employ a number of methods to enable it to meet its emission targets: Hydro will use washed and low-sulphur coal, modify additional burners on coal-fired units to produce less nitrogen oxide (two units have already

Health and Safety

been converted at the Nanticoke station), purchase hydro-electric power from neighbouring utilities, and rely on the output of the growing number of nuclear units.

Hydro's environmental efforts are not restricted to improving air quality. The past year saw the testing of a new process to remove low levels of PCBs (polychlorinated biphenyls, an environmental pollutant) from transformer insulating oil. This process, developed jointly by Ontario Hydro and B.C. Hydro, safely turns low-level PCBs into common salt and other harmless by-products. Pending government approval, plans call for a specially designed mobile decontamination unit to treat the PCB-contaminated oil that is now stored at Hydro sites across the province.

To maintain low radioactivity in the work place, Ontario Hydro is building a tritium extraction facility at the Darlington nuclear station. This facility will remove tritium, a low-level radioactive waste product of the CANDU reactor fission process.



PCBs (polychlorinated biphenyls) in transformer insulating oil are converted to common salt and other harmless by-products by a mobile decontamination unit. The unit was developed and field tested as a pilot project during 1984.

A primary concern in the area of health and safety has been to reduce on-the-job fatalities. For the first time, the corporate fatality rate dipped below six fatalities per hundred million hours worked (based on a ten-year average). Although there was one fatality in 1984 (which demonstrates the need for continued attention), Hydro staff should be proud of their overall efforts to significantly reduce the rate over the long term.

Also noteworthy is the reduction in days lost due to disabling injuries. In the Regions Branch, this was at an all-time low - remarkably, only one-seventh of the average for the previous five years.

Equally impressive was the record achieved by the Nuclear Generation Division. It has completed one hundred million hours worked (from 1955 to 1984) without a single on-the-job fatal accident.

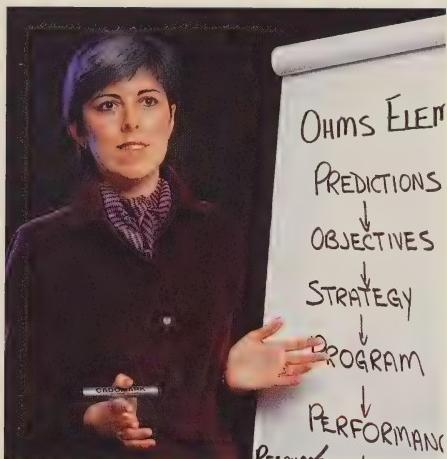
Hydro workers have been the subject of a 14-year epidemiological study of mortality rates. Preliminary results of this study, being carried out by an independent medical consultant, became available in 1984. They indicate no elevated cause of death for current or retired nuclear or fossil station workers. In fact, there were significantly fewer deaths among the Ontario Hydro groups studied than among comparable members of the general population.

Hydro Staff

Over the past three years, Ontario Hydro has been in transition, adjusting to the slowdown in the province's economic growth. That transition has been both a very difficult and a very successful one.

The major corporate objective has been a reliable supply of electricity at reasonable cost. But developments early in the decade made that difficult. The economic slowdown, along with the more efficient use of energy, meant much slower growth in electricity demand. At the same time new stations, which had been planned a decade earlier during times of rapid growth, were being brought into service, and the charges for these plants had to be absorbed into the rate base.

The challenges Hydro faced were twofold: first, to reduce and redeploy staff in response



Hydro's trainers are helping to keep Hydro staff ready to meet changing energy needs through a variety of carefully designed training courses.

to reduced needs for the design and construction of new stations, and second, to reduce and control operation, maintenance, and administration costs.

The Corporation's success in meeting these challenges was in no small measure due to the attitude and actions of Hydro's staff, who recognized the need for electricity to remain price competitive in energy markets, and for tight budgetary control in order to keep rate increases down.

Now that economic recovery is under way, it is clear that the contributions staff made during the period of restraint have paid off handsomely. Their continuing efforts will ensure that Hydro is well positioned, and electricity well priced, to meet the growing energy demands of an expanding economy.

End-of-year statistics already show that reduced inflation, higher nuclear output, and cuts in operation, maintenance and administration costs are pointing the way to smaller electricity price increases.

During 1984, the trend toward reduced staff levels continued. Despite new generating units being added to the system, there was a reduction in regular staff from 23,373 to 22,991.

Of the employees whose jobs were phased out during the year, 86 per cent were redeployed elsewhere in the Corporation. Hydro

has made it a priority to offer retraining and other assistance to employees who change jobs, and this has improved the ability of staff to make the transition into different responsibilities and positions.

Ontario Hydro also recognizes the special need to ensure fair and equitable opportunities for women in the Corporation. That is why an affirmative action program was instituted during the year, with the backing of Hydro's Executive Office.

The goals of the program are to encourage the promotion of more women into Hydro management, and to increase the number of women in traditionally male-dominated areas. The long-term objective is to increase the number of women in Ontario Hydro to better reflect the distribution of women in the provincial work force.

The Hydro lineman of today carries more tools and follows more rigorous safety standards than his counterpart in the 1930s, but he's still extending service or trouble shooting, day or night in all weathers.



Transmission

With completion of the generating stations currently under construction, Ontario Hydro will have in place plants to produce enough economic electrical power to meet the province's needs to the end of the century. However, progress has been slower on projects to build sufficient transmission lines to move that power to where it is needed throughout the province.

In southwestern Ontario, additional environmental studies were initiated following a decision by a Divisional Court that the notice of public hearings, as determined by the government-appointed Joint Board, was inadequate. This decision overturned the approval of previous transmission studies in the region.

The court decision delayed the project, but new studies are making headway, and Hydro is preparing to apply again for government approval of specific transmission routes. The new lines will carry additional power out of the Bruce nuclear station and into a wide area of southwestern Ontario.

In the eastern portion of the province, the need for new lines is growing more critical as the Ottawa area grows. The year ended with the Joint Board beginning its hearing into Hydro's plans to construct new bulk power

transmission lines into the Ottawa area. However, another Divisional Court decision early in 1985 indicated that Ontario Hydro had not adequately defined its undertaking in the Plan Stage of the route selection process, and this has delayed the progress of the hearings.

Growing power demand in northern Ontario's Algoma area has prompted Hydro to proceed with plans for a major new transmission line into that area. The line has already been granted government approval, and will run from the Sudbury area to near Thessalon, connecting Ontario's east and west transmission systems. Construction is scheduled to begin in 1985, with the 210-kilometre line to come into service by December 1987.

Much of the work in transmission over the next few years will involve the upgrading of existing facilities and the completion of smaller transmission projects. Although of smaller scale than major transmission routes, these projects are no less necessary for assuring residents and businesses of the reliable power they have come to expect of their electrical utilities. One project under way is the long-sought-after upgrading of the Toronto Cecil transformer station in downtown Toronto, for which much of the design work was completed in 1984.

Helicopters have replaced teams of horses (inset) in Hydro's transmission line-stringing operations. Over the past 30 years, the building of transmission lines has become much less labour-intensive, but selecting routes has become much more complicated.



Marketing

Marketing plays a critical role in Hydro's corporate strategy for the 1980s. By balancing the needs of customers with the ability of the Corporation to meet those needs, marketing can help ensure that resources are used to maximize benefits to Hydro's customers.

One of the goals the Corporation has set for itself is to hold the average rate increase for the decade of the 1980s to no more than the average rate of inflation. The marketing of

This regional hospital at Attiwapiskat in northern Ontario relies on diesel generation to extend the full range of modern medicine to a thinly populated area. Hydro consultants helped the hospital reduce heating costs through improved use of energy.

electricity can help make better use of new generating capacity, and therefore help keep down the price of electricity.



But marketing can secure other benefits as well. By promoting new and better applications for electricity, it can help customers use energy more wisely, and by encouraging the substitution of electricity for oil, it can support national off-oil objectives and promote greater energy security for Ontario.

Hydro's marketing efforts and those of its municipal utility partners are directed toward wise energy management. In the residential sector, programs have been instituted to make customers aware of a variety of home heating options like heat pumps, plenum and baseboard heaters, and electric furnaces.

In the commercial sector, Hydro staff provide energy management assistance to building managers and consultants, both for conversion of older buildings and for energy efficient new construction.

The greatest potential growth in electricity demand lies in the industrial sector. Developing technologies such as plasma arc melting complement more established equipment like

industrial heat pumps in offering customers greater potential cost savings and product quality improvements.

Whatever the sector, Ontario Hydro sees marketing's main objective as customer satisfaction for the people of Ontario. The electrical utilities of the province recognize that wise energy management can and will vary according to customer needs, financial situation, and geography. Furthermore, using electricity to better the quality of life of a community need not always involve a high-technology approach.

For example, Ontario Hydro has entered into an agreement with a hospital in Attawapiskat, a community on the shore of James Bay. The project involves taking waste heat from diesel generators that are used to produce electricity for the community, and feeding that heat to the nearby hospital. This will allow the hospital to cut its oil consumption by 86,000 litres a year, which will substantially reduce its energy costs.

In the 1930s, Hydro's marketing included travelling tents showing the latest electric appliances for sale (inset). Today, marketing goes beyond sales to include conservation and the wise use of energy. Hydro consultants were part of the planning and design team for Simcoe Hall, a new school and health-care centre in Oshawa. They helped organize long-term cost savings through efficient use of electricity.



New Business Ventures

In January 1984, Ontario Hydro created the New Business Ventures Division to promote the sale of Hydro expertise in the international marketplace.

New Business Ventures brings together many diverse projects not directly related to the production and distribution of electrical energy to Ontario consumers.

In its first year of operation the Division focused on investigating market opportunities and identifying business areas. These areas include consulting services to developing countries, technology sales and services, the sale of isotopes and by-products of electricity production, heat energy sales and services, and advanced energy technologies.

From the outset, Hydro has signalled that its intentions are to assist and act in concert with private companies. An agreement with the Consulting Engineers of Ontario sets out the areas of cooperation in the international marketplace.

The Division had a number of successes during its first year. Among these were three agreements: one with a Toronto company for the manufacture and world-wide marketing of a programmable computer device developed by Hydro, another with the Turkish Electricity Authority for modernizing its system, and a third with the California Department of Water Resources for the supply of Hydro-developed computer software.

Strictly in the consulting services area, the Division at year-end had on its books 20 active contracts in seven countries worth \$10 million; five of these contracts are in cooperation with other Canadian corporations. These figures suggest that Hydro has much to offer the world market. Net revenues from New Business Ventures go toward reducing the Corporation's net revenue requirement.

Electricity Exports and Purchases

An important element in the marketing of electricity is the sale of power to utilities outside the province. In the face of stiff competition from other exporting utilities, Hydro set about to market aggressively during the year. It did so very successfully.

Export sales during 1984 earned an income of \$164 million on revenues of \$427 million. This performance reflects the efforts of staff,

the relative low cost of power in Hydro's system, and continuing markets for electricity south of the border. Energy exports reached 10.6 billion kilowatt-hours, with sales going mostly to utilities in New York, Michigan, and Vermont.

In order to increase the ability to export power to New York, a new interconnection was placed in service across the Niagara River at the Sir Adam Beck I generating station. The cost of this 115-kilovolt tie line was shared by Ontario Hydro and Niagara Mohawk Power Corporation.

Income earned from electricity exports provided a direct benefit to Ontario customers by reducing Hydro's rate increase requirements for 1984 by 4.5 per cent. Power exports also provided a direct benefit to the Canadian economy by contributing to our balance of payments with the United States.

Ontario Hydro continued to buy power from other utilities when purchasing electricity was less costly than producing it from Hydro's own plants. Such purchases help reduce the cost to Ontario consumers. The bulk of the 8.2 billion kilowatt-hours of electricity Hydro purchased during the year was inexpensive hydro-electric energy from Quebec and Manitoba. While these purchases totalled \$127 million, the savings they realized over Hydro's own generating costs amounted to about \$25 million.

Electricity Rates

Ontario Hydro sells power directly to about 25 per cent of Ontario's electricity customers, and to a number of large industries. The rest of the province is served by 316 autonomous municipal utilities that set their own rates, under Hydro's approval. There are variations (usually small) in rates from one area to another, but average electricity rates in Ontario represent good value. Ontario's rates, both residential and industrial, are comparable to the lowest utility rates in Canada, and are well below rates elsewhere in the world.

In October, Hydro's Board of Directors approved a 1985 rate increase to the three main customer groups - 8.5 per cent for municipalities, 8.8 per cent for direct industrial customers, and 8.7 per cent for rural retail customers. The rural rate increase takes into

account \$56 million in assistance provided by all electricity consumers in the province to reduce the electricity bills of year-round rural residential customers. The level of assistance in 1984 was \$46 million.

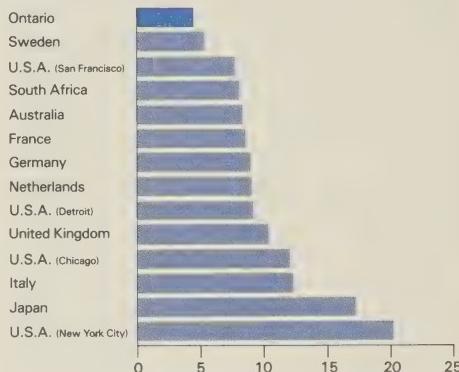
These rate increases followed the recommendations of the Ontario Energy Board, which conducted weeks of public hearings. The Board recognized the need to cover expected increases in the prices of fuel, labour, and materials, and to pay for new generating units coming into service. The cost of retubing Pickering units 1 and 2 added about one percentage point to the rate increase.

In March 1985, Ontario Hydro announced a 1986 rate increase proposal of 3.6 per cent. This, the lowest increase in 20 years, is due in part to the efficiency of nuclear generation in Hydro's system.

Ontario's industries and residents will continue to enjoy the advantage of low rates as long-term cost savings are realized from the nuclear generating units now entering service

or under construction. It is anticipated that electricity rates will fall well below inflation during the 1990s.

Average Price (¢) per kW.h*
International Comparison



*Based on 1983 residential rates at 7,500 kWh annual consumption. (Source - the Electricity Council, London, U.K.)

Ontario Hydro's plans for the future are very much based on the principles that have characterized its 79-year history. Ontario's energy self-sufficiency remains a cornerstone of the Corporation's reason for being, and the guarantee of a reliable supply of electricity at a competitive price remains critical to the province's continued industrial strength.

Providing for future needs encompasses planning in the broad sense of looking at how Ontario Hydro can best supply the growing demand for electrical energy. It also means influencing demand - finding more efficient ways for customers to use electricity, and adapting electricity to take over a greater number of tasks previously performed by other forms of energy.

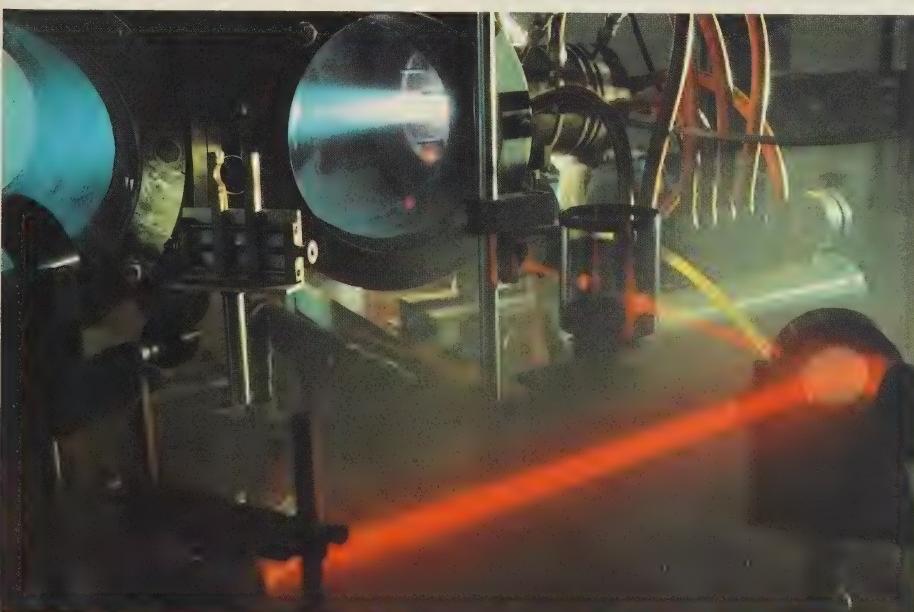
During the past year, Ontario Hydro continued its work in new and better applications for electricity. A new industrial applications laboratory was opened to help industries adapt electrical processes to their particular requirements. Improvements and refinements in industrial heat pumps, for example, hold considerable potential for reducing energy costs and improving product quality in many

manufacturing processes. Hydro has continued developmental work on high temperature plasma arcs for efficient use in chemical, metallurgical, and ceramics processing. Plasma offers promise of better control, a cleaner process, and lower cost. Work carried out during the year was aimed at developing a lower-cost plasma torch.

Residential and commercial applications for electricity are being focused on improved energy management. Ontario Hydro is involved in testing and adapting new control technology that is making it possible to treat the home or office as a complete energy system. The goal is to minimize the customer's costs by getting maximum benefit from the energy used while maintaining proper air quality and a comfortable human environment. For example, "intelligent" panel boards can automatically adjust the current to baseboard heaters and other major electrical equipment to avoid overloading.

Aside from continuing developmental work on specific electrical equipment and applications, Ontario Hydro has been looking at demand options in their broadest sense. Dur-

A better understanding of industrial applications for plasma technology will emerge from the experiments being conducted by Hydro today. Here, a laser beam (red line) is being used to measure particle activity in an experimental plasma chamber. Powders injected into the plasma flow scatter the laser beam, allowing researchers to measure particle velocities.



ing 1984, the Corporation initiated an in-depth examination of all options available to meet the anticipated growth in the electricity needs of Ontario consumers.

Anticipating growth has become much more difficult for electric utilities, as it has for other industries. The past dozen years have seen shifts in energy prices and supplies, increased attention to conservation, the introduction of lengthy approval processes, greater awareness of environmental impact, and two major recessions. Electric utilities are particularly vulnerable to such changes because of the length of time (ten years or more) it takes to bring major facilities from the planning stage into operation.

Consequently, Ontario Hydro has been developing a new approach to forecasting. Providing for future needs no longer means picking a single load growth projection and building for it. The new approach involves measuring a strategy against a number of different economic and social scenarios to see how well it can accommodate various uncertainties.

Accommodating uncertainties requires flexibility to balance Ontario's need for electricity and Hydro's capability to supply it. During the year the Corporation initiated an extensive supply/demand study that explores ways of avoiding electrical load (demand options) as well as ways of supplying it (supply options).

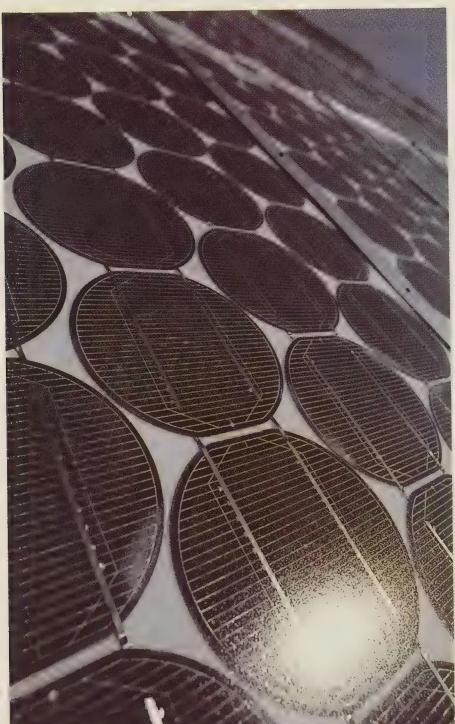
Demand options under review include load management, conservation, cogeneration, innovative rates for industry, dual energy programs, and time-of-use rates. Each of these, either individually or in combination, could make a contribution toward minimizing the amount of new capacity to be added to the system.

But some new sources will be necessary to accommodate future load growth, and Hydro is exploring all possible options. These include traditional sources like nuclear and coal-burning plants, small hydraulic stations, cogeneration, and purchased power, as well as the so-called soft options like biomass, solar, and wind power.

Further down the road are other potential sources of energy. For example, fusion holds the most potential of any future energy source. The Canadian Fusion Fuels Technology Project is designed to strengthen Canada's scientific and industrial role in fusion fuels research. Ontario Hydro is participating in this project along with the Ontario Government and the Government of Canada. If fusion ever becomes commercially successful, Hydro will have the opportunity to benefit from as well as participate in developing this new energy source.

Looking ahead, one thing does seem certain. The uses for electricity will continue to increase. Each decade has spawned more and more uses for electricity. Its energy market share has grown consistently, and probably has more room for growth than any other type of energy. Electricity is by nature an adaptable form of energy. Ontario Hydro wants to ensure that it remains a reliable and economic one.

The first grid-connected residential photovoltaic cells in Canada generate 1 kilowatt of power on sunny days to meet the needs of the curator's home at the Kortright Centre for Conservation near Kleinburg, Ont. When power exceeds requirements of the home it is fed into the Vaughan Hydro system. At night, or during periods of inadequate sunshine, electricity is supplied by the utility.



FINANCIAL SECTION

Financial Review

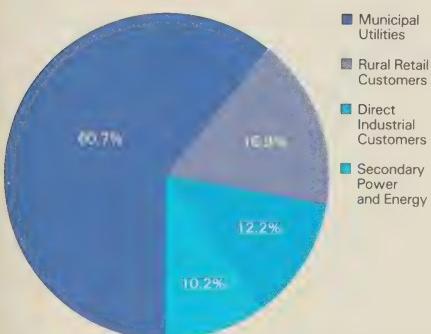
Ontario Hydro's revenues in 1984 totalled \$4,212 million. Primary sales of electricity to customers in Ontario amounted to \$3,783 million, while secondary sales, mainly to United States utilities, totalled \$429 million in 1984. Primary revenues increased 12.7% or \$426 million over 1983 due to a 7.8% average increase in power rates and a 4.9% increase in the volume of sales. The average increase in rates for municipal utilities was 8.0%, while the average rate increases for direct industrial customers and rural retail customers were 7.6% and 7.5%, respectively. The 1984 sales volume to municipal utilities, rural retail and direct industrial customers increased 4.8%, 3.1% and 7.6%, respectively, mainly due to weather-related factors and economic recovery in 1984. Secondary revenues decreased 4.2% or \$19 million from 1983 reflecting a more competitive export market.

Ontario Hydro's total operating costs in 1984 amounted to \$3,637 million compared to \$3,333 million in 1983, an increase of 9.1%. Costs increased largely as a consequence of escalating prices for fossil fuels and the tripling of water rental rates effective June 1984, and increased interest and foreign exchange costs and depreciation.

Source of Revenues in 1984

Total Revenues

\$4,212 Million



Energy-related costs comprised primarily of fuel, purchased power and water rentals increased 3.5% over 1983. Electric energy generated by nuclear stations supplied 33% of total energy to the system in 1984. Hydraulic stations supplied 30% and higher-cost fossil-fuelled generation provided 30%. Purchases of

Application of Revenues in 1984

Total Revenues

\$4,212 Million



power from interconnected utilities provided the remaining 7% of energy supplied to the system in 1984. The cost of fuel used for electric generation totalled \$1,036 million in 1984, an increase of \$58 million or 5.9% over 1983. This increase was primarily due to the higher cost of fossil-fuelled generation and the increased volume of energy generated in 1984. Water rentals amounted to \$61 million in 1984, an increase of \$33 million or 118% over 1983 as a result of the water rental rates being tripled in June 1984. Purchases of power in 1984 amounted to \$149 million, an increase of \$23 million over 1983. In 1984, units 1 and 2 of Pickering Nuclear Generating Station did not operate as these units were taken out of service during 1983 to replace the pressure tubes. The maintenance and overhead costs during the shutdown were included in the payback calculation in accordance with the Nuclear Agreement. As a result, the 1984 operating costs of Ontario Hydro were reduced by \$36 million representing the amount to be offset against future amounts payable by Ontario Hydro to Atomic Energy of Canada Limited and the Province of Ontario, the other two parties to the Nuclear Agreement. In 1983, nuclear payback accounted for a \$37 million charge to the costs of operations.

During 1984, costs associated with the operation, maintenance and administration of Ontario Hydro's facilities amounted to \$884 million. The decrease of \$68 million or 7.1% over 1983 was mainly due to the financial impact of a change in accounting policy whereby, beginning in 1984, the costs of train-

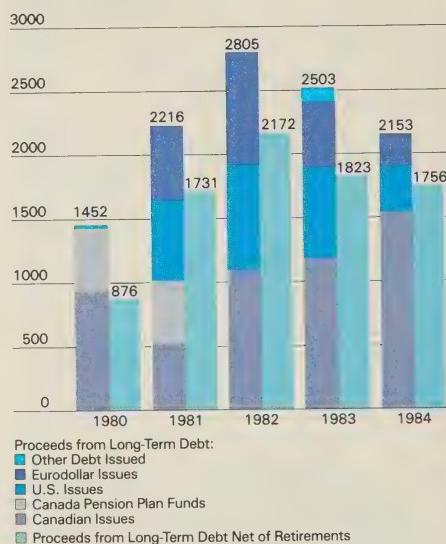
ing initial operating staff for new facilities were capitalized rather than, as in prior years, charged to operations in the year incurred. This change was made to achieve a better matching of costs and benefits by including such training costs in the capital cost of the related new facility and depreciating these training costs over the estimated service life of the facility. In addition, the full year's impact of the effort to reduce staff levels initiated during 1983 contributed to the decrease in 1984 operation, maintenance and administration costs. A lump sum payment of \$53 million was charged to the costs of operations in 1983 as a special retirement allowance to approximately 1,300 long-term-service employees who elected to take early retirement. The decreases in costs realized in 1984 were partially offset by escalation in labour and other costs.

Depreciation costs charged to operations totalled \$476 million in 1984, an increase of \$80 million or 20.2% over 1983. This increase resulted primarily from additional facilities being placed in service, including Pickering Nuclear Generating Station unit 6 and Bruce Nuclear Generating Station unit 6, and from the full year's financial impact of Pickering Nuclear Generating Station unit 5 being placed in service during 1983. In addition, depreciation costs increased because of the change in the amortization rate for the recovery of the value of Bruce Heavy Water Plant "D".

Interest and foreign exchange costs charged to operations totalled \$1,067 million in 1984, \$251 million or 30.8% higher than in 1983. These higher financing costs resulted from a \$189 million increase in interest costs charged to operations, and a \$62 million increase in foreign exchange costs during the year. The increase in interest costs primarily resulted from financing costs associated with Pickering unit 6 and Bruce unit 6 being charged to operations in 1984 upon the units being placed in service, and from the full year's financial impact of Pickering unit 5 being placed in service in 1983. The increase in foreign exchange costs is related primarily to the financial impact of the change in the accounting policy for the translation of long-term debt denominated in foreign currencies to Canadian currency. Beginning in 1984, an exchange gain or loss arising from the translation of debt

at current rates of exchange was amortized on an annuity basis over the remaining life of the debt. In prior years, no exchange gain or loss resulted from the translation of debt until twelve months before the maturity date. The change was made to achieve a better allocation to operating results of the financial impact of an exchange gain or loss on debt payable in foreign currencies, and to conform with the Canadian Institute of Chartered Accountants' new accounting recommendations related to foreign currency translation.

Funds Provided from Financing
Millions of Dollars



Net income for 1984 was \$575 million, \$103 million higher than in 1983. As required by the Power Corporation Act, \$210 million of net income was appropriated for debt retirement purposes in 1984. The remaining \$365 million of 1984 net income was appropriated to the Reserve for the Stabilization of Rates and Contingencies. The interest coverage and debt ratio indicators of Ontario Hydro's financial soundness were:

Financial indicators	1984	1983
Interest coverage	1.25	1.24
Debt ratio	.833	.840

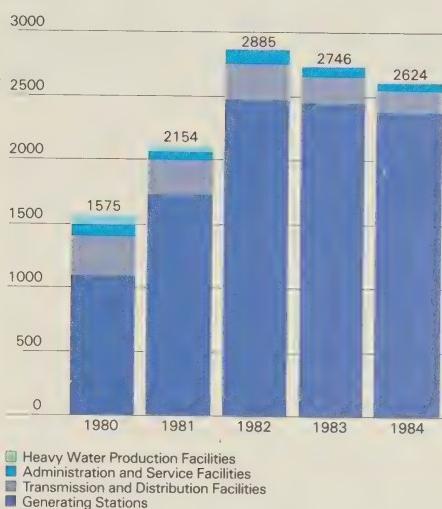
The funds required by Ontario Hydro to finance the investment in fixed assets were provided from two major sources, operations and financing. In 1984, funds from operations provided \$1,246 million of Ontario Hydro's total requirements, while \$1,756 million was provided by long-term debt financing. Compared to 1983, these amounts were \$259 million higher and \$67 million lower, respectively.

The proceeds from the issue of bonds, notes and other long-term debt by Ontario Hydro during 1984 amounted to \$2,153 million. Canadian currency issues amounted to \$1,593 million. In addition, the proceeds from a United States bond issue of U.S. \$250 million and from a Eurodollar bond issue of U.S. \$200 million amounted to Cdn. \$316 million and Cdn. \$244 million, respectively. The average coupon interest rate for long-term debt issued in 1984 was 12.5%, compared to 10.9% in 1983. Funds amounting to \$266 million were used to retire maturing long-term debt in 1984 compared to \$492 million in 1983. In addition, during 1984, funds amounting to \$131 million were used to redeem debt prior to maturity, compared to \$188 million in 1983.

Investment in fixed assets was \$2,624 million during 1984. Major capital expenditures were \$2,370 million for generation facilities including \$324 million for heavy water, \$169 million for transmission and distribution facilities, and \$85 million for administration and service facilities. Investment in fixed assets was \$122 million lower than in 1983, the result of decreased expenditures of \$95 million on generation facilities, \$17 million on transmission and distribution facilities, and \$10 million on administration and service facilities. The expenditures on major generation projects under construction during 1984 and 1983 were:

During 1984, unit 6 at the Pickering Nuclear Generating Station "B" and unit 6 at the Bruce Nuclear Generating Station "B" were placed in service at a cost of \$2,206 million, including \$396 million for heavy water. Pickering Nuclear Generating Station "B" unit 7 was placed in service in January 1985.

Investment in Fixed Assets
Millions of Dollars



	1984	1983
	millions of dollars	
Nuclear generation		
Bruce "B"	680	753
Pickering "B"	266	368
Darlington	855	698
Fossil generation		
Atikokan	109	167

The accompanying financial statements have been prepared by management in accordance with generally accepted accounting principles in Canada. Such principles, except for the changes in accounting policies described under "Fixed assets" and "Foreign currency translation", have been applied on a basis consistent with that of the preceding year. In management's opinion, the financial statements have been properly prepared within reasonable limits of materiality and in the light of information available up to March 11, 1985. To assist the reader in understanding the financial statements, the Corporation's significant accounting policies are summarized below:

Rate setting

Ontario Hydro has broad powers to generate, supply and deliver electric power throughout the Province of Ontario. The Corporation operates under the Power Corporation Act and is subject to provisions of the Ontario Energy Board Act.

Under the provisions of the Power Corporation Act, the price payable by customers for power is the cost of supplying the power. Such cost is defined in the Act to include the cost of operating and maintaining the system, depreciation, interest, and the amounts appropriated for debt retirement and stabilization of rates and contingencies. The debt retirement appropriation is the amount required under the Act to accumulate on a sinking fund basis over 40 years a sum equal to the debt incurred for the cost of the fixed assets in service. The appropriation for, or withdrawal from, the stabilization of rates and contingencies reserve is an amount established to maintain a sound financial position and to stabilize the effect of cost fluctuations.

Under the provisions of the Ontario Energy Board Act, a public hearing before the Ontario Energy Board is required in respect of any changes in electricity rates proposed by Ontario Hydro which affect its municipal utilities, direct industrial customers, or, if the Minister of Energy so directs, rural retail customers. The Ontario Energy Board submits its recommendations to the Minister of Energy. After considering the recommendations of the Ontario Energy Board, the Board of Directors of Ontario Hydro, under the authority of the Power Corporation Act, establishes the electricity rates to be charged to customers.

If the Board of Directors specifies a certain cost or gain is to be included in future electricity rates that would otherwise be charged or credited to operations in the current year, then this cost or gain is deferred and amortized to future operations on a basis consistent with its inclusion in rates.

Fixed assets

Fixed assets in service include operating facilities and non-operating reserve facilities. Construction in progress includes fixed assets under construction and heavy water held for use in nuclear generating stations under construction.

Fixed assets are capitalized at cost which comprises material, labour and engineering costs, as well as overheads, depreciation on service equipment and interest applicable to capital construction activities. In the case of generation facilities, the cost also includes the net cost of commissioning, and for nuclear generation, the cost of heavy water. The net cost of commissioning is the cost of start-up less the value attributed to energy produced by generation facilities during their commissioning period. The cost of heavy water comprises the direct cost of production and applicable overheads, as well as interest and depreciation on the heavy water production facilities. Leases which transfer the benefits and risks of ownership of assets to Ontario Hydro are capitalized.

Effective January 1, 1984, the costs of training initial operating staff for new facilities, and project development costs incurred subsequent to the date a preferred alternative has been recommended by Ontario Hydro, are capitalized. Prior to January 1, 1984, such training costs, and project development costs up to the point the project received final approval, were charged to operations. In addition, effective January 1, 1984, for multi-unit facilities, a proportionate share of the cost of common facilities is placed in service with each major operating unit. Prior to January 1, 1984, the total cost of common facilities was placed in service with the first operating unit.

Interest is capitalized on construction in progress at rates (1984 - 13.8%, 1983 - 14.0%) which approximate the average cost of long-term funds borrowed in the years in which expenditures have been made for fixed assets under construction. If the construction period

of a project is extended and the construction activities are continued, interest is capitalized during the period of extension provided that the project has a reasonable expectation of completion.

If a project is cancelled, or deferred indefinitely with a low probability of construction being resumed in the future, all costs, including the costs of cancellation, are written off to operations.

If fixed assets are removed from operations and mothballed for future use, the costs of mothballing are charged to operations.

Depreciation

The capital costs of fixed assets in service are depreciated on a straight-line basis. Depreciation rates for the various classes of assets are based on their estimated service lives, which are subject to periodic review. Changes in service life estimates are implemented on a remaining service life basis from the year the change can be first reflected in electricity rates. Major components of generating stations are depreciated over the lesser of the service life expectancy of the component or the remaining service life of the associated generating station.

The estimated service lives of assets for 1984 and 1983 in the major classes are:

Generating stations	
- hydraulic	- 65 to 100 years
- fossil	- 25 to 35 years
- nuclear	- 40 years
Heavy water	- over the period ending in the year 2040
Transmission and distribution	- 20 to 55 years
Administration and service	- 5 to 60 years
Heavy water production facilities	- 11 to 20 years

In accordance with group depreciation practices, for normal retirements the cost of fixed assets retired is charged to accumulated depreciation with no gain or loss being reflected in operations. However, gains and losses on sales

of fixed assets, and losses on premature retirements are charged to operations in the year incurred as adjustments to depreciation expense.

When the net costs of removal on retirements of fixed assets can be reasonably estimated and are significant, provisions for net removal costs are charged to depreciation expense on an annuity basis over the remaining service life of the related fixed assets. Other net removal costs are charged to depreciation expense as incurred. Net removal costs include the estimated costs of decommissioning nuclear stations and the estimated costs of removing certain nuclear reactor fuel channels. Estimates of net removal costs, interest and escalation rates, and the service life periods are subject to periodic review. Changes in estimated costs are implemented on a remaining service life basis from the year the changes can be first reflected in electricity rates.

Fixed assets removed from operations and mothballed for future use, termed non-operating reserve facilities, are amortized so that any estimated loss in value is charged to depreciation expense on a straight-line basis over their expected non-operating period.

Unamortized advances for fuel supplies

As part of its program to ensure the adequate supply of fuels for its generating stations, Ontario Hydro has entered into long-term fuel supply contracts. Where these contracts require Ontario Hydro to make payments for pre-production costs to suppliers in advance of the fuel delivery, these payments and associated costs, including interest, are carried in the accounts as unamortized advances for fuel supplies. The advances are amortized to fuel inventory as the fuels are delivered.

Fuel for electric generation

Fuel used for electric generation comprises the average inventory costs of fuel consumed, charges for commissioning energy produced, and provisions for disposal of nuclear fuel irradiated during the period. The inventory cost of fuel consumed comprises fuel purchases, transportation and handling costs, and the amortization of advances for fuel supplies. Transportation costs include charges for interest and depreciation on railway equipment owned by Ontario Hydro. The charges for commissioning energy produced during the

period represent the incremental operating and fuel costs of producing the same quantity of energy at generating units displaced because of the commissioning activity. The costs for disposal of nuclear fuel irradiated in each period are charged to operations based on estimated future expenditures and interest accumulating to the estimated date of disposal. Estimates of expenditures, interest and escalation rates, and the date of disposal are subject to periodic review. Adjustments resulting from changes in estimates are charged to operations on an annuity basis over the period from the year the changes can be first reflected in electricity rates to the estimated in-service date of the disposal facility.

Foreign currency translation

Current monetary assets and liabilities are translated to Canadian currency at year-end rates of exchange and the resulting gains or losses are credited or charged to operations. Effective January 1, 1984, long-term debt payable in foreign currencies is translated to Canadian currency at year-end rates of exchange. Resulting unrealized exchange gains or losses are deferred and included in unamortized debt costs, and are amortized to operations on an annuity basis over the remaining life of related debt. In addition, foreign exchange gains or losses on early redemption of long-term debt are deferred and amortized to operations on an annuity basis over the average life of debt denominated in the same currency issued during the previous year. Prior to January 1, 1984, long-term debt payable in foreign currencies was translated at rates of exchange at the time of issue, except for debt payable within one year which was translated at year-end rates of exchange. Resulting exchange gains and losses, including those arising from early redemption of debt, were credited or charged to operations in the current year.

Unamortized debt costs

Unamortized debt costs include the unamortized amounts related to unrealized foreign exchange gains or losses resulting from the translation of foreign currency long-term debt, foreign exchange gains or losses on the early redemption of long-term debt, and discounts or premiums arising from the issuance of debt or the acquisition of debt prior to maturity.

Debt discounts or premiums arising on the issuance of debt are amortized over the period to maturity of the debt. Discounts or premiums on debt acquired prior to the date of maturity are amortized over the period from the acquisition date to the original maturity date of the debt.

Nuclear agreement - Pickering units 1 and 2

Ontario Hydro, Atomic Energy of Canada Limited and the Province of Ontario are parties to a joint undertaking for the construction and operation of units 1 and 2 of Pickering Nuclear Generating Station, with ownership of these units being vested in Ontario Hydro. Contributions to the capital cost by Atomic Energy of Canada Limited and the Province of Ontario amounted to \$258 million and these have been deducted in arriving at the value of fixed assets in service in respect of Pickering units 1 and 2. Ontario Hydro is required to make monthly payments until the year 2001 to each of the parties in proportion to their capital contributions. These payments, termed "payback", represent in a broad sense the net operational advantage of having the power generated by Pickering units 1 and 2 as compared with coal-fired units similar to Lambton units 1 and 2.

Pension plan

The pension plan is a contributory, defined benefit plan covering all regular employees of Ontario Hydro. Ontario Hydro is responsible for all deficiencies and surpluses in the pension plan. Pension costs, as actuarially determined, consist of current service costs and amounts required to amortize any surpluses or unfunded liabilities. A net unfunded liability arising from past service obligations is amortized up to fifteen years. All other net unfunded liabilities or net surpluses in the fund are amortized up to five years.

Research and development

Research and development costs are charged to operations in the year incurred, except for those related directly to the design or construction of a specific capital facility.

Ontario Hydro**Statement of Operations**

for the year ended December 31, 1984

	1984	1983
	millions of dollars	
Revenues		
Primary power and energy		
Municipal utilities	2,555	2,265
Rural retail customers	712	644
Direct industrial customers	516	448
	3,783	3,357
Secondary power and energy (note 1)	429	448
	4,212	3,805
Costs		
Operation, maintenance and administration	884	952
Fuel used for electric generation	1,036	978
Water rentals (note 2)	61	28
Power purchased	149	126
Nuclear agreement - payback (note 3)	(36)	37
Depreciation (note 4)	476	396
	2,570	2,517
Income before financing charges	1,642	1,288
Interest (note 5)	949	760
Foreign exchange (note 6)	118	56
	1,067	816
Net income	575	472
Appropriation for:		
Debt retirement	210	185
Stabilization of rates and contingencies	365	287
	575	472

See accompanying summary of significant accounting policies and notes to financial statements.

Ontario Hydro

Statement of Financial Position

as at December 31, 1984

Assets	1984	1983
millions of dollars		
Fixed assets (note 7)		
Fixed assets in service	17,215	14,655
Less accumulated depreciation	4,069	3,606
	13,146	11,049
Construction in progress	9,001	8,899
	22,147	19,948
Current assets		
Cash and short-term investments	658	358
Accounts receivable	442	471
Fuel for electric generation (note 8)	973	759
Materials and supplies, at cost	179	191
	2,252	1,779
Other assets		
Unamortized debt costs (note 11)	1,447	80
Unamortized advances for fuel supplies (note 9)	883	894
Unamortized deferred costs (note 10)	358	399
Long-term accounts receivable and other assets	214	94
	2,902	1,467
	27,301	23,194

See accompanying summary of significant accounting policies and notes to financial statements.

Liabilities	1984	1983
	millions of dollars	
Long-term debt (note 11)	20,659	17,977
Current liabilities		
Accounts payable and accrued charges	616	526
Short-term notes payable	49	26
Accrued interest	672	579
Long-term debt payable within one year	847	263
	2,184	1,394
Other liabilities		
Long-term accounts payable and accrued charges	152	166
Accrued irradiated fuel disposal and fixed asset removal costs (note 12)	222	148
	374	314
Contingencies (notes 3 and 13)		
Equity		
Equities accumulated through debt retirement appropriations	2,366	2,156
Reserve for stabilization of rates and contingencies	1,591	1,226
Contributions from the Province of Ontario as assistance for rural construction	127	127
	4,084	3,509
	27,301	23,194

On behalf of the Board

Chairman

Toronto, Canada,
March 11, 1985.

President

Ontario Hydro

Statement of Equities Accumulated Through

Debt Retirement Appropriations

for the year ended December 31, 1984

	Municipal Utilities	Power District (Rural Retail and Direct Industrial Customers)	Totals
			1984 1983
millions of dollars			
Balances at beginning of year	1,510	646	2,156 1,971
Debt retirement appropriation	143	67	210 185
Balances at end of year	1,653	713	2,366 2,156

Statement of Reserve for Stabilization of Rates and Contingencies

for the year ended December 31, 1984

	Held for the benefit of all customers	Held for the benefit of (or recoverable from) certain groups of customers			Totals	
		Municipal Utilities	Rural Retail Customers	Direct Industrial Customers	1984	1983
millions of dollars						
Balances at beginning of year	1,237	1	(11)	(1)	1,226	939
Appropriation	377	—	(12)	—	365	287
Balances at end of year	1,614	1	(23)	(1)	1,591	1,226

See accompanying summary of significant accounting policies and notes to financial statements.

Ontario Hydro**Statement of Source of Funds Used for Investment
in Fixed Assets**

for the year ended December 31, 1984

	1984	1983
	millions of dollars	
Funds generated from operations		
Net income	575	472
Charges not requiring funds in the current year	476	396
Depreciation	120	—
Amortization of unrealized foreign exchange gains and losses	21	40
Provision for irradiated fuel disposal costs	54	79
Other	1,246	987
Funds provided from financing		
Long-term debt issued	2,153	2,503
Less retirements	397	680
	1,756	1,823
Other uses of funds (note 14)	(111)	(37)
Increase in working capital excluding long-term debt payable within one year (note 15)	(267)	(27)
Investment in fixed assets	2,624	2,746

See accompanying summary of significant accounting policies and notes to financial statements.

1. Secondary power and energy

Secondary power and energy revenues include \$427 million (1983 - \$447 million) from sales of electricity to United States utilities.

2. Water rentals

Water rentals are the amounts paid primarily to the Province of Ontario for the use of water for hydraulic generation. In prior years, these amounts were included in the cost of fuel used for electric generation. The 1983 comparative figures have been reclassified to conform with the 1984 financial statement presentation.

3. Nuclear agreement - payback

During 1983, units 1 and 2 of the Pickering Nuclear Generating Station were shut down for replacement of pressure tubes and did not operate for a period of time in 1983 and during 1984. The Nuclear Agreement, which is described in the Summary of Significant Accounting Policies, allows maintenance and overhead costs during the shutdown period to be included in payback calculations. The calculations have resulted in negative payback amounts of \$8 million in 1983 and \$36 million in 1984. These amounts, totalling \$44 million, have been credited against the costs of operations for the respective years and are included in "Long-term accounts receivable and other assets". The basis for this accounting treatment is the belief by Ontario Hydro that under the Nuclear Agreement, these amounts, termed "negative payback", plus interest, can be offset against future positive payback amounts payable to the Province of Ontario and to Atomic Energy of Canada Limited when the units return to service. Atomic Energy of Canada Limited has objected to this interpretation and takes the position that "negative payback" is not to be offset against future positive payback amounts. The interpretation of the Nuclear Agreement and the manner of recovering costs associated with the rehabilitation of units 1 and 2 are being discussed among the parties to the Nuclear Agreement.

In accordance with an agreement dated March 14, 1983, between Atomic Energy of Canada Limited and Ontario Hydro, provisions for irradiated fuel disposal costs related to Pickering Nuclear Generating Station units 1 and 2 have been included, subject to further discussions, in the calculation of payback for the years 1982, 1983 and 1984. The parties to the Nuclear Agreement are discussing whether these provisions are properly allowable costs for the period 1982 to 1984, and also whether such costs should continue to be included in the calculation of payback subsequent to 1984. Atomic Energy of Canada Limited and the Province of Ontario's share of irradiated fuel disposal costs included in the calculation of payback for the years 1982, 1983 and 1984 totalled \$16 million at December 31, 1984.

4. Depreciation

	1984	1983
	millions of dollars	
Depreciation of fixed assets in service	511	478
Amortization of deferred costs	40	17
Provision for net removal costs	30	31
Other net removal costs	13	9
	594	535
Less:		
Depreciation charged to - heavy water production	80	111
- construction in progress	26	26
- fuel for electric generation	2	2
Gain on sales of fixed assets	10	—
	118	139
	476	396

Depreciation of fixed assets in service includes \$45 million (1983 - \$26 million) for the amortization of non-operating reserve facilities (see note 7).

5. Interest	1984	1983
	millions of dollars	
Interest on bonds, notes, and other debt	2,298	2,000
Interest on accrued irradiated fuel disposal and fixed asset removal costs	24	12
	2,322	2,012
Less:		
Interest charged to - construction in progress	1,063	966
- heavy water production	117	124
- fuel for electric generation	97	35
- unamortized advances for fuel supplies	16	69
Interest earned on investments	80	58
	1,373	1,252
	949	760

6. Foreign exchange	1984	1983
	millions of dollars	
Amortization of unrealized foreign exchange gains and losses	120	—
Exchange loss on redemption and translation of foreign long-term debt	—	54
Net exchange (gain) loss on other foreign transactions	(2)	2
	118	56

The amortization of unrealized foreign exchange gains and losses, and the exchange loss on redemption and translation of foreign long-term debt reflect the implementation of the change in the accounting policy for foreign currency translation, effective January 1, 1984, as described in the Summary of Significant Accounting Policies.

7. Fixed assets	1984		
	Assets in Service	Accumulated Depreciation	Construction in Progress
	millions of dollars		
Generating stations - hydraulic	1,818	514	13
- fossil	2,041	629	655
- nuclear	4,898	542	6,747
Heavy water	1,149	112	1,308
Transmission and distribution	4,310	1,088	241
Administration and service	845	341	37
Heavy water production facilities	1,123	232	—
Non-operating reserve facilities			
- fossil generating stations	794	374	—
- heavy water production facilities	237	237	—
	17,215	4,069	9,001

7. Fixed assets (continued)

	1983		
	Assets in Service	Accumulated Depreciation	Construction in Progress
millions of dollars			
Generating stations - hydraulic	1,776	483	42
- fossil	2,108	606	546
- nuclear	3,021	437	6,696
Heavy water	753	96	1,302
Transmission and distribution	4,153	1,001	251
Administration and service	758	307	59
Heavy water production facilities	1,360	387	3
Non-operating reserve facilities			
- fossil generating stations	726	289	—
	14,655	3,606	8,899

Non-operating reserve facilities consist of Lennox, R. L. Hearn, J. C. Keith and Thunder Bay unit 1 fossil generating stations, and Bruce Heavy Water Plant "A" (1983 - Lennox, R. L. Hearn and two units of J. C. Keith). There are varying degrees of certainty in connection with the plans for these facilities resuming operation.

Construction in progress at December 31, 1984:

	Remaining Number of Units Scheduled	Planned In-Service Dates	Dependable Capacity to Be Placed in Service	Costs Incurred to December 31, 1984	Estimated Costs to Complete (Excluding Escalation and Interest)
megawatts					
Nuclear generating stations (including heavy water)					millions of dollars
Pickering "B"	2	1985	1,032	1,731	120
Bruce "B"	3	1985-87	2,385	3,655	390
Darlington	4	1988-92	3,524	2,463	3,670
Fossil generating station Atikokan	1	1985	206	640	20
All other construction in progress	—	—	—	512	—
				9,001	

Estimated costs to complete are the most recent projections. These estimates exclude cost escalation and interest which are forecast to average 8% and 13% per year, respectively, over the period 1985 to 1992. Because of the uncertainties associated with long construction lead times and planned in-service dates, these costs to complete are subject to change.

The fuel channel replacement program for Pickering "A" units 1 and 2 is estimated to cost \$390 million, excluding interest and escalation. Of this total, \$217 million is to be capitalized as installation costs, and the remaining \$173 million is related to the removal costs of the existing pressure tubes and is being recovered through charges to operations as described in note 12. The actual expenditures for installation costs, excluding interest, totalled \$70 million as of December 31, 1984 and are included in "All other construction in progress" in the above table. The first two units of Pickering "A" are expected to be returned to service in 1986 and 1987.

For 1985, additional investment in fixed assets is estimated to be approximately \$2,670 million including escalation and interest.

8. Fuel for electric generation	1984	1983
millions of dollars		
Inventories - coal	546	465
- uranium	427	294
	973	759

9. Unamortized advances for fuel supplies	1984	1983
millions of dollars		
Uranium	801	800
Coal	82	94
	883	894

Based on present commitments, additional advance payments for fuel supplies will total approximately \$67 million over the next five years, including approximately \$13 million in 1985.

10. Unamortized deferred costs	1984	1983
millions of dollars		
Bruce Heavy Water Plant "D"	317	353
Wesleyville Generating Station	41	46
	358	399

Bruce Heavy Water Plant "D" is an indefinitely deferred project with a low probability of construction being resumed in the future. The capital cost of this project is being amortized for recovery through electricity rates at an annual rate of 10% over the period 1984 to 1993. The amortization rate for 1983 was 4%. The unamortized deferred costs associated with the cancelled Wesleyville Generating Station project are being amortized for recovery through electricity rates at an annual rate of 10% over the period 1984 to 1993. These amortization rates were specified by the Board of Directors under its rate-setting authority.

11. Long-term debt	1984	1983
millions of dollars		
Bonds and notes payable	21,293	18,017
Other long-term debt	213	223
	21,506	18,240
Less payable within one year	847	263
	20,659	17,977

11. Long-term debt (continued)

Bonds and notes payable:

Bonds and notes payable, expressed in Canadian dollars, are summarized by years of maturity and by the currency in which they are payable in the following table:

Years of Maturity	1984			Weighted Average Coupon Rate	1983		
	Principal Outstanding				Principal Outstanding	Weighted Average Coupon Rate	
	Canadian	Foreign	Total				
millions of dollars							
1984	—	—	—		243		
1985	463	364	827		777		
1986	150	201	351		297		
1987	715	276	991		918		
1988	837	321	1,158		1,135		
1989	546	777	1,323		—		
1 – 5 years	2,711	1,939	4,650	11.7	3,370	11.2	
6 – 10 years	1,522	3,360	4,882	12.7	3,741	12.6	
11 – 15 years	1,179	628	1,807	8.6	1,388	8.2	
16 – 20 years	3,109	901	4,010	11.6	3,084	11.9	
21 – 25 years	1,402	2,766	4,168	9.9	3,514	9.7	
26 – 30 years	735	1,041	1,776	14.5	2,920	12.8	
	10,658	10,635	21,293	11.6	18,017	11.3	
Currency in which payable:							
Canadian dollars			10,658		9,225		
United States dollars			10,498		8,670		
Swiss francs			92		71		
West German Deutsche marks			45		51		
			21,293		18,017		

Bonds and notes payable in United States dollars include Canadian \$6,966 million (1983 – Canadian \$5,792 million) of Ontario Hydro bonds held by the Province of Ontario and having terms identical with Province of Ontario issues sold in the United States on behalf of Ontario Hydro. All bonds and notes payable are either held, or guaranteed as to principal and interest, by the Province of Ontario.

The 1984 balances of bonds and notes payable in foreign currencies are translated into Canadian currency at rates of exchange at the end of the year, and the resulting unrealized exchange gains or losses are deferred and included in "Unamortized debt costs" under "Other assets". The 1983 amounts are translated at rates of exchange at time of issue and if translated at 1983 year-end rates of exchange, the total amount of these liabilities would be increased by \$925 million as of December 31, 1983, and there would be a corresponding increase in "Unamortized debt costs" included under "Other assets".

11. Long-term debt (continued)

Other long-term debt:

	Year of Maturity	Interest Rate	1984	1983
millions of dollars				
Balance due to Atomic Energy of Canada Limited on purchase of Bruce Heavy Water Plant "A"	1992	7.8%	150	164
Capitalized lease obligation for the Head Office building, payable in U.S. dollars	2005	8.0%	51	41
Capitalized lease obligations for transport and service equipment	1986 to 1988	6.8% to 12.0%	12 213	18 223

Payments required on the above debt, excluding interest, will total \$101 million over the next five years. The amount payable within one year is \$20 million (1983 - \$20 million). The 1984 balance of the capitalized lease obligation for the Head Office building is translated into Canadian currency at the rate of exchange at the end of the year. The 1983 amount is translated at the rate of exchange at the time the lease was signed and if translated at the year-end rate of exchange, the total amount of this liability would be increased by \$9 million as of December 31, 1983.

**12. Accrued irradiated fuel disposal and fixed
asset removal costs**

	1984	1983
millions of dollars		
Accrued irradiated fuel disposal costs	147	110
Accrued fixed asset removal costs	75	38
222		

Irradiated fuel disposal costs:

- The significant assumptions used in estimating the future irradiated fuel disposal costs were:
- an in-service date of the year 2010 for irradiated nuclear fuel disposal facilities (1983 - year 2000);
 - a transportation distance of 1,000 kilometres from nuclear generating facilities to disposal facilities (1983 - 1,600 kilometres);
 - interest rates through to the disposal date ranging from 10% to 16% (1983 - 10% to 17%); and
 - escalation rates through to the disposal date ranging from 6% to 12% (1983 - 7% to 12%).

Because of the uncertainties associated with the technology of disposal, and the above factors, these costs are subject to change.

12. Accrued irradiated fuel disposal and fixed asset removal costs (continued)

Fixed asset removal costs:

Fixed asset removal costs are the costs of decommissioning nuclear generating stations after the end of their service lives, and the costs of removing certain fuel channels from nuclear reactors which are expected to be replaced during the life of the reactors.

The significant assumptions used in estimating decommissioning costs were:

- decommissioning on the deferred dismantlement basis (dismantlement following storage with surveillance for a 30-year period after shutdown of the reactors);
- a transportation distance of 1,000 kilometres from nuclear generating facilities to disposal facilities (1983 – 1,600 kilometres);
- interest rates through to 2061 (1983 – 2060) ranging from 10% to 16% (1983 – 10% to 17%); and
- escalation rates through to 2061 (1983 – 2060) ranging from 6% to 12% (1983 – 7% to 13%).

The significant assumptions used in estimating the fuel channel removal costs were:

- removal of fuel channels in Pickering NGS "A" units 1 to 4 and Bruce NGS "A" units 1 to 3 in the 1994 to 2006 period;
- interest rates through to 2006 ranging from 10% to 16% (1983 – 10% to 17%); and
- escalation rates through to 2006 ranging from 6% to 11% (1983 – 7% to 12%).

Because of the uncertainties associated with the technology of decommissioning and fuel channel removal, and the above factors, these costs are subject to change.

The dates for the removal of fuel channels in Pickering units 1 and 2 have been subsequently revised to the period 1984 to 1987. The financial impact of this revision will be included in operating costs commencing in 1985 when the provision for removal costs is to be increased and reflected in electricity rates. The fuel channel removal costs incurred of \$46 million exceed the amounts provided as of December 31, 1984 by \$38 million. The amount of \$38 million is included with "Long-term accounts receivable and other assets" and will be recovered through the provision for removal costs over the period 1985 to 1987.

13. Fuel oil contract

Ontario Hydro contracted with Petrosar Limited for the purchase of 20,000 barrels of residual fuel oil per day through to April 1992. Deliveries for the years 1981 and 1982 were 6% and 2%, respectively, of the contract quantities. No deliveries were taken during 1983 and 1984. Amounts have been charged to the costs of operations in prior years to provide for settlement with respect to reduced deliveries up to and including 1982. Ontario Hydro advised Petrosar Limited on May 24, 1983 that the contract is at an end due to Petrosar's prior undertaking to the Government of Canada to limit its production of residual fuel oil to an amount less than the contracted quantities. Petrosar has commenced actions claiming damages of \$45.5 million and \$59.9 million for failure to take the contract quantities in 1981 and 1982, respectively. Ontario Hydro has counterclaimed for \$39.4 million paid to Petrosar Limited in 1980, 1981 and 1982 and an accounting for the difference between market and contract prices for residual fuel oil supplied since the date of such undertaking. The result of these actions and counterclaims and the rights of Petrosar Limited under the contract are not determinable.

14. Other (uses) sources of funds	1984	1983
	millions of dollars	
Proceeds on sales of fixed assets	28	23
Fixed asset removal costs net of salvage proceeds	(46)	(12)
Advances for fuel supplies net of amortization	11	(135)
Increase in long-term accounts receivable and other assets	(120)	(3)
(Decrease) increase in long-term accounts payable and accrued charges	(14)	85
Other - net	30	5
	(111)	(37)

15. (Increase) decrease in working capital excluding long-term debt payable within one year	1984	1983
	millions of dollars	
Cash and short-term investments	(300)	95
Accounts receivable	29	(107)
Fuel for electric generation	(214)	43
Materials and supplies	12	8
Accounts payable and accrued charges	90	(37)
Short-term notes payable	23	(87)
Accrued interest	93	58
	(267)	(27)

16. Pension and insurance plans

Ontario Hydro's employee benefit programs include pension and insurance plans. The assets of the pension, group life insurance and long-term disability plans and the changes in assets during the year are shown in the financial statements of The Pension and Insurance Fund, and are not included in Ontario Hydro's financial statements.

The most recent actuarial valuation of Ontario Hydro's pension plan as at December 31, 1983 reported a surplus of approximately \$115 million (December 31, 1982 - \$16 million).

The significant actuarial assumptions used in the 1983 and 1982 valuations were:

- rate used to discount future investment income - 8.5%, and future benefits - 8%;
- salary escalation rate - 8%;
- average retirement age for males - 61.2 and for females - 60.7; and
- corporate shares valuation - five-year average.

The experience surplus for 1983 of \$129 million, partially offset by an unfunded liability of \$30 million for plan improvements, increased the pension plan surplus by \$99 million.

The pension plan costs for 1984 were \$51 million (1983 - \$73 million) after the deduction of \$28 million (1983 - \$4 million) for the amortization of pension plan surplus.

The group life insurance plan had a surplus of approximately \$33 million as of December 31, 1984 and 1983. This surplus is available to cover the costs of the group life insurance, long-term disability and pension plans.

17. Research and development

In 1984, approximately \$55 million of research and development costs were charged to operations and \$17 million were capitalized (1983 - \$58 million and \$4 million, respectively).

18. Changes in accounting policies

Changes in accounting policies, as described in the Summary of Significant Accounting Policies, were implemented effective January 1, 1984. These changes have been applied on a prospective basis because of the nature of the environment in which Ontario Hydro establishes its electricity rates. The financial impact on total operating costs of these changes was reflected in the Corporation's 1984 electricity rates.

Total operating costs for the year ended December 31, 1984 were (decreased) increased by the following amounts which reflect the financial impact of these changes in accounting policies:

	millions of dollars
Fixed assets	
Capitalization of training costs	(27)
Earlier capitalization of project development costs	(8)
Change in capitalization of common facilities	(47)
Foreign currency translation	
Amortization of unrealized foreign exchange gains and losses	
on long-term debt	53
Amortization of foreign exchange gains and losses on early redemption of long-term debt	(10)
Net decrease in total operating costs	<u>(39)</u>

19. Statement of Source of Funds Used for Investment in Fixed Assets

The Statement of Source of Funds Used for Investment in Fixed Assets has been revised to highlight that funds used for investment in fixed assets are provided from two primary sources, operations and financing. Investment in fixed assets is Ontario Hydro's total expenditures on capital assets during the year. In 1983, this statement was titled Statement of Changes in Financial Position. The 1983 amounts have been reclassified to conform with the 1984 presentation.

Auditors' Report

To the Board of Directors of Ontario Hydro:

We have examined the statement of financial position of Ontario Hydro as at December 31, 1984 and the statements of operations, equities accumulated through debt retirement appropriations, reserve for stabilization of rates and contingencies and source of funds used for investment in fixed assets for the year then ended. Our examination was made in accordance with generally accepted auditing standards, and accordingly included such tests and other procedures as we considered necessary in the circumstances.

In our opinion, these financial statements present fairly the financial position of Ontario Hydro as at December 31, 1984 and the results of its operations and the source of funds used for investment in fixed assets for the year then ended in accordance with generally accepted accounting principles. Further, in our opinion, such principles, except for the changes in accounting for foreign currency translation, common facility costs, training costs and project development costs as described in the summary of significant accounting policies and note 18, have been applied on a basis consistent with that of the preceding year.

Toronto, Canada,
March 11, 1985.

CLARKSON GORDON
Chartered Accountants

	1984	1983	1982	1981	1980
millions of dollars					
Revenues					
Primary power and energy					
Municipal utilities	2,555	2,265	1,997	1,800	1,603
Rural retail customers	712	644	576	546	513
Direct industrial customers	516	448	395	391	342
	3,783	3,357	2,968	2,737	2,458
Secondary power and energy	429	448	419	424	361
	4,212	3,805	3,387	3,161	2,819
Costs					
Operation, maintenance and administration	884	952	854	765	618
Fuel used for electric generation ⁽¹⁾	1,036	978	877	742	674
Depreciation	476	396	348	325	306
Other ⁽¹⁾	174	191	217	213	170
	2,570	2,517	2,296	2,045	1,768
Income before financing charges and extraordinary item					
	1,642	1,288	1,091	1,116	1,051
Financing charges					
Gross interest	2,322	2,012	1,708	1,370	1,166
Capitalized interest	(1,293)	(1,194)	(968)	(628)	(401)
Investment income	(80)	(58)	(67)	(85)	(109)
Foreign exchange	118	56	70	52	19
	1,067	816	743	709	675
Income before extraordinary item					
	575	472	348	407	376
Extraordinary item	—	—	—	—	160
Net income					
	575	472	348	407	216
Financial position					
Total assets	27,301	23,194	20,721	17,830	15,593
Fixed assets	22,147	19,948	17,600	15,448	13,630
Long-term debt	20,659	17,977	15,882	13,663	12,005
Equity	4,084	3,509	3,037	2,690	2,284
Sources and use of funds⁽¹⁾					
Funds from operations	1,246	987	820	771	698
Funds from financing	1,756	1,823	2,172	1,731	876
Investment in fixed assets	2,624	2,746	2,885	2,154	1,575
Financial indicators					
Interest coverage ⁽²⁾	1.25	1.24	1.20	1.30	1.32
Debt ratio ⁽³⁾	.833	.840	.845	.841	.846

	1984	1983	1982	1981	1980
--	------	------	------	------	------

in cents per kilowatt-hour of total energy sales

Average revenue⁽⁴⁾

Primary power and energy

Municipal utilities	3.440	3.210	2.981	2.710	2.470
Rural retail customers	5.143	5.027	4.475	4.269	3.970
Direct industrial customers	2.896	2.740	2.614	2.290	2.080
Secondary power and energy	4.037	3.768	3.895	3.838	3.363
All classifications combined	3.586	3.409	3.203	2.945	2.685

expressed as a %

Average rate increases

Municipal utilities	8.0	8.2	9.6	9.3	8.6
Rural retail customers	7.5	8.8	8.7	11.2	6.2
Direct industrial customers	7.6	8.5	10.0	9.6	7.1

in cents per kilowatt-hour of energy generated

Average cost⁽⁴⁾⁽⁵⁾

Hydraulic

Operation, maintenance and administration	.184	.159	.173	.149	.109
Fuel - water rentals	.164	.076	.073	.066	.058
Depreciation and financing charges	.384	.345	.360	.351	.324
	.732	.580	.606	.566	.491

Nuclear

Operation, maintenance and administration	.506	.491	.487	.411	.349
Fuel - uranium	.361	.357	.384	.232	.239
Depreciation and financing charges	1.330	1.026	.883	.807	.765
	2.197	1.874	1.754	1.450	1.353

Fossil

Operation, maintenance and administration	.348	.368	.402	.374	.342
Fuel - coal, gas and oil	2.500	2.417	2.328	2.097	1.856
Depreciation and financing charges	.597	.586	.683	.611	.645
	3.445	3.371	3.413	3.082	2.843

Footnotes

- (1) Figures for 1980-1983 have been reclassified to conform with the 1984 financial statement presentation.
- (2) Interest coverage represents income before extraordinary item plus interest on bonds, notes, and other debt divided by interest on bonds, notes, and other debt.
- (3) Debt ratio represents debt (bonds and notes payable, short-term notes payable, other long-term debt, and accrued irradiated fuel disposal and fixed asset removal costs less unamortized foreign exchange gains and losses) divided by debt plus equity.
- (4) Figures for 1984 are preliminary.
- (5) Average cost per kilowatt-hour represents the costs attributable to generation but excludes the costs related to transmission, distribution and corporate administrative activities. These figures reflect the historical accounting costs of operating facilities and the actual energy generated by these facilities during the year.

Ontario Hydro

Comparative Statistics

	1984	1983	1982	1981	1980
Customer statistics⁽¹⁾	in millions of kilowatt-hours				
Primary energy sales					
Municipal utilities	74,285	70,601	67,019	66,416	64,899
Rural retail	13,845	12,825	12,867	12,783	12,936
Direct industrial	17,816	16,348	15,119	17,077	16,432
	105,946	99,774	95,005	96,276	94,267
Secondary energy sales	10,627	11,900	10,753	11,063	10,727
in thousands					
Total Ontario customers:					
Residential	2,658	2,604	2,559	2,528	2,493
Farm	107	108	110	110	112
Commercial and industrial	343	339	335	329	322
	3,108	3,051	3,004	2,967	2,927
in kilowatt-hours per customer					
Average annual use:					
Residential	10,300	10,149	9,976	9,852	9,821
Farm	22,556	21,389	21,135	20,731	19,978
Commercial and industrial	210,000	200,436	194,376	204,575	202,582
in cents per kilowatt-hour					
Average revenue:					
Residential	5.06	4.69	4.34	3.96	3.60
Farm	5.24	4.87	4.50	4.11	3.74
Commercial and industrial	3.77	3.50	3.28	2.92	2.66
Operating statistics					
Dependable peak capacity ('000 kW) ⁽²⁾	26,612	25,269	24,906	24,595	24,457
December primary peak demand ('000 kW)	18,052	18,792	16,872	16,600	16,808
Primary energy made available ('000,000 kW•h)	112,293	106,071	100,836	101,659	100,174
Total staff, average for year	29,613	31,233	32,654	30,850	28,902

Footnotes

- (1) Figures for 1984 are preliminary. Two former direct industrial customers are now included in the municipal utilities total: Great Lakes Power (709 million kW•h); Gananoque Light and Power Ltd. (60 million kW•h).
- (2) Includes mothballed generation: 1984 – 3,999,200 kW; 1983 – 3,783,200 kW; 1982 – 3,034,200 kW; 1981 – 1,913,000 kW; and 1980 – 1,704,000 kW.

Board of Directors

1984

J. A. Gordon Bell, Thornhill
Vice-Chairman, Ontario Hydro
Deputy Chairman, President and
Chief Operating Officer,
Bank of Nova Scotia

Arthur J. Bowker, Ottawa
Senior Research Officer
National Research Council

Tom Campbell, Toronto
Chairman, Ontario Hydro
(from August 20, 1984)

Alan B. Cousins, Wallaceburg
Former President
Ideal Stampings Limited

John B. Cronyn, London
Director
John Labatt Limited

A. Ephraim Diamond, Toronto
Deputy Vice-Chairman, Ontario Hydro
President
Whitecastle Investments Limited

John W. Erickson, Q.C., Thunder Bay
Barrister and Solicitor

Isobel Harper, Toronto
Vice-President, W. H. Harper Inc.

Albert G. Hearn, Agincourt
Former President
Service Employees International Union

***Milan Nastich**, Toronto
Chairman, Ontario Hydro
(to August 19, 1984)
President, Ontario Hydro

O. John C. Runnalls, Toronto
Chairman
Centre for Nuclear Engineering
and Professor of Energy Studies
University of Toronto

Leonard N. Savoie, Sault Ste. Marie
President and Chief Executive Officer
Algoma Central Railway

William A. Stewart, London
Farmer and Former Minister
of Agriculture for Ontario

Officers

Chairman of the Board
Tom Campbell
(from August 20, 1984)

***Milan Nastich**
(to August 19, 1984)

President

***Milan Nastich**

Vice-Chairman

J. A. Gordon Bell

Deputy Vice-Chairman

A. Ephraim Diamond

Senior Executive Vice-President
Patrick G. Campbell

Executive Vice-Presidents

E. H. (Ted) Burdette
Planning and Administration

Sam G. Horton
Engineering and Services

Arvo Niitenberg
Operations

Vice-Presidents

Ron W. Bartholomew
Finance

L. A. (Vern) Coles
Regions

C. S. (Cliff) Elliott
Human Resources

H. Allen Jackson
Production

Dane B. MacCarthy
Marketing

John G. Matthew
Supply and Services

Lorne G. McConnell
Power System Program

William G. Morison
Design and Construction

J. B. (Jim) Smith
Corporate Relations

Secretary and General Counsel

William E. Raney, Q.C.
(to March 31, 1984)

General Counsel and Secretary

Lawrence E. Leonoff
(from April 1, 1984)

Treasurer

Dirk Peper

Corporate Comptroller

Ian R. Russell

Regional Directors

Central Region

H. K. (Hal) Wright
5760 Yonge Street
Willowdale M2M 3T7

Eastern Region

P. J. (Phil) Garlough
420 Dundas Street East
Belleville K8N 5C3

Georgian Bay Region

F. A. (Al) Perttula
93 Bell Farm Road
Barrie L4M 1H1

Northeastern Region

C. G. (Gord) Sanford
590 Graham Drive
North Bay P1B 8L4

Northwestern Region

J. D. (Jack) Hamer
34 Cumberland Street North
Thunder Bay P7A 4L5

Western Region

Dr. David A. Drinkwater
1075 Wellington Road
London N6E 1M1

*while remaining President, Milan Nastich also served as Chairman April 1, 1983 to August 19, 1984

Committees of the Board of Directors (as of December 31, 1984)

Finance

T. Campbell (Chairman)
J. A. G. Bell
A. J. Bowker
A. E. Diamond
M. Nastich
L. N. Savoie

Audit

A. E. Diamond (Chairman)
I. Harper (Vice-Chairman)
A. J. Bowker
T. Campbell
A. B. Cousins
J. B. Cronyn
A. G. Hearn

Management Resources

J. A. G. Bell (Chairman)
A. J. Bowker
T. Campbell
J. B. Cronyn
O. J. C. Runnalls
L. N. Savoie
W. A. Stewart

Social Responsibility

A. J. Bowker (Chairman)
T. Campbell
A. B. Cousins
J. W. Erickson
I. Harper
A. G. Hearn
W. A. Stewart

Technical Advisory

O. J. C. Runnalls (Chairman)
A. J. Bowker
T. Campbell
J. W. Erickson
M. Nastich



CA20N
EP
A55



Ontario Hydro
Annual Report 1985



**Ontario Hydro
Head Office**
700 University Avenue
Toronto, Ontario
M5G 1X6

Contents

Corporate Profile	2
Meeting Future Energy Needs	2
Message from the Chairman	2
1985 in Review	2
Financial Section	2
Five-year Summary of	4
Financial Statistics	4
Comparative Statistics	4

	1985	1984
Financial Highlights		
Revenues	4,625	4,2
Net Income	360	5
Total Assets	29,320	27,3
Investment in Fixed Assets	2,541	2,6
	(millions of dollars)	

Front Cover

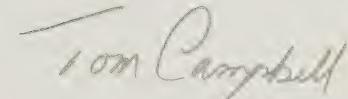
Ontario Hydro has met the diverse electrical needs of residential, commercial and industrial customers across the province for many years. Guaranteeing Ontario with the same level of service in the future is the challenge that lies ahead. Meeting that challenge tomorrow begins with planning today.

Report of the
Board of Directors of
Ontario Hydro for the Year 1985

To:
The Honourable Vincent G. Kerrio,
Minister of Energy

We, the Board of Directors, submit to you this report of the financial position and relevant Ontario Hydro activities for the year 1985. We would like to thank you and the staff of the Ministry of Energy for the cooperation and understanding extended during the year.

On behalf of the Board,

A handwritten signature in black ink, appearing to read "Tom Campbell".

Tom Campbell, Chairman
April, 1986



The Corporation

Ontario Hydro is a corporation without share capital created by a special statute of the Province of Ontario in 1906. It now operates under the authority of the Power Corporation Act, R.S.O. 1980, Chapter 384, as amended, with broad powers to generate, supply and deliver electric power throughout the province. It is also authorized to produce and sell steam and hot water as primary products. The Corporation's prime objective is to supply the people of Ontario with electricity at the lowest feasible cost consistent with high safety and quality of service standards.

Ontario Hydro's main activity is wholesaling electric power to municipal utilities in urban areas who, in turn, retail it to customers in their service areas. Ontario Hydro also serves directly more than 100 large industrial customers and 797,555 rural retail customers in areas or communities not served by municipal utilities. In 1985, approximately 3,166,000 customers were served by

Ontario Hydro and the municipal utilities in the province.

Ontario Hydro operates 81 hydraulic, fossil and nuclear generating stations and an extensive power grid across Ontario to meet the province's demands for electric energy. Interconnections with other systems place the Corporation in an extensive electrical grid that covers a large segment of the North American continent.

In addition, Ontario Hydro exercises certain regulatory functions over municipal utilities and also exercises the approval and inspection functions for electrical equipment (in conjunction with the Canadian Standards Association) and electrical wiring installations throughout the province.

Ontario Hydro is a financially self-sustaining corporation. The Province of Ontario guarantees bonds and notes issued to the public by the Corporation.

Ontario Hydro's head office is located at 700 University Avenue, Toronto, Ontario. For administrative

and operational purposes, six regional and 51 area offices are maintained throughout the province.

The business and affairs of Ontario Hydro are directed and controlled by a board of directors consisting of a chairman, a president, a vice-chairman, and not more than 10 other directors. All of the members of the Board who represent a broad spectrum of Ontario society, are appointed by the Lieutenant Governor in Council of the province except the president who is full-time employee of the Corporation appointed by the Board.

To assist the Board in directing the Corporation's affairs, there are five Committees of the Board—Finance, Audit, Management Resources, Social Responsibility, and Technical Advisory. These committees review and make recommendations to the Board on matters within their terms of reference.

Meeting Future Energy Needs

Choices, Options, Directions

In the early years of this century, Ontario Hydro was created to meet a growing province's demand for reliable and affordable electric power. For over three-quarters of a century, we have met that demand, providing the people and industries of Ontario with electricity when and where they need it. As we move toward a new century, our commitment to reliable and economical electricity continues to direct our activities. But to meet that commitment tomorrow, we have to start planning today. Unlike other energy forms such as oil or natural gas, electricity can't be stored for future use. However, our supply system still has to be able to meet the electricity needs of our customers on the warmest and coldest day of the year.

How much power will we need on a frigid January day 12 years from now? That's an important question because it takes that long to plan and build for emerging needs. It is also a tough question because there are so many variables affecting electricity use in everything from competing energy prices, to changes in population, to levels of economic growth.

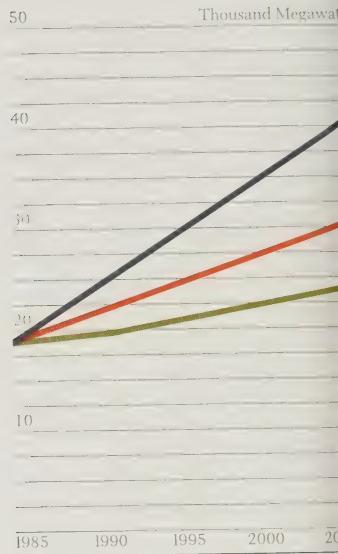
Even taking all these into account, we recognize that the future can unfold in a number of different ways. So, in making our forecasts, we look at a wide range of possible scenarios. According to the most probable scenario, we expect a growth in demand for electricity of 2.6 per cent annually until the year 2000.

But things could be different. Demand growth could be significantly higher or lower. When projected to the end of this century, the difference between our upper and lower forecasts is about 2,000 megawatts. An additional 12,000 megawatts of demand is equivalent to just over three Darlington-sized stations. (Darlington's installed capacity will be 3,600 megawatts.)

So we have to plan carefully. Right now, we have enough power in place to meet our current needs. With the completion of our Darlington station in 1992, we will be able to meet the province's most probable level of demand for electricity through the late 1990s, along with maintaining a customary "reserve margin" of power for emergencies.

Ontario Hydro Primary Demand 1985-2005

■ Upper Load
■ Most Probable Load
■ Lower Load



But what will we do then? If we're going to need more power, common sense tells us we had better start considering our choices now. We have a number of options for meeting future electricity needs - some on the supply side and some on the demand side. The prudent course is to explore these various options and determine which combination will allow us to meet future demand in the most efficient and cost-effective way.

So what are our electricity choices for the future? Ultimately, we can generate it ourselves, buy it from someone else, or control how much of it we need. We believe the best course for our energy future will be a combination of all three.

One supply option that we've chosen in the past is building new plants.

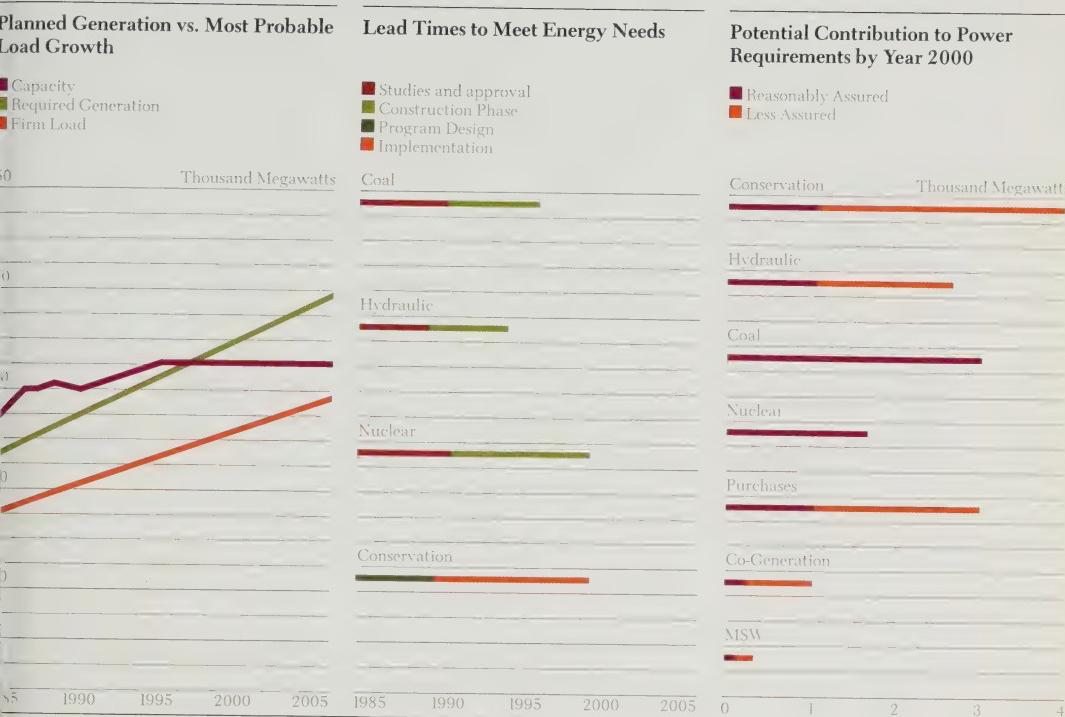
Hydraulic power was the cornerstone of Ontario Hydro's supply system. But we're running out of large potential sites where the water falls far enough and fast enough to produce significant amounts of economical power. Even so, we are now exploring what smaller sites can offer.

While the potential for additional coal-fired stations is high, the practical problems of fuel prices and acid gas emissions have to be surmounted.

Finally, there's nuclear energy. It has been a part of Hydro's supply system for more than 20 years. With the completion of our Darlington station, nuclear energy will play a predominant role in Ontario's electricity supply.

Building any plant - nuclear, coal, or hydraulic - is a costly and time-consuming process. A hydraulic or coal-fired plant takes about 10 years to build. For a nuclear plant, the lead time could be up to 14 years. And, in a climate of uncertain demand, committing ourselves to major new plants may not be the most flexible solution to meeting our energy needs.

We may, however, be able to refurbish older plants. For example, Ontario Hydro has over 12,000 megawatts of fossil-fired capacity. Several of our coal units are coming close to the end of their service lives. By refurbishing these older plants, we can lengthen their service lives significantly. At the same



me, we can equip these plants with state-of-the-art emission control technology, thereby reducing acid rain emissions.

Other supply options include alternate energy sources such as solar and wind power or the burning of municipal solid waste (MSW). While not likely to be major contributors to Ontario's power supply, these sources could be valuable in specialized applications. Using specialized applications where appropriate is part of our planning philosophy. We recognize that energy needs will develop differently in various parts of the province, and that some options will work better in some areas. Our planning will reflect that diversity.

Beyond generating electricity ourselves, we could buy it from other utilities and producers. We do import some power today, in peak and emergency situations or when buying it is more economical than producing it ourselves. We may consider making more firm purchase arrangements with neighbouring utilities so that the imported power acts as a dependable supplement to our power supply. In addition, we may be able to tap into other sources of generation within the province by encouraging independent producers to sell power to us through cogeneration or other parallel generation schemes.

There is another alternative. Rather than always increasing supply to meet the demand for electricity, we can also moderate that demand. This can, in turn, reduce the need for more supply. That's the essence of demand management. We've been practising demand management through conservation for several years. In fact, conservation and other demand-oriented options are likely to play a significant part in tomorrow's energy picture.

Which of these options will we choose? That's what we're determining right now. Looking at a whole range of options will help us find out how we can best meet Ontario's electricity needs in the coming years. It's clear that no single option will do this. Rather, a combination of options, carefully chosen and properly timed, will be the key to our electricity future.

Chairman's Message

In the high-voltage laboratory, research technologist, Rob Cilic, describes some of the lab equipment to Chairman Tom Campbell.

During 1985, Ontario continued to benefit from a strengthening economy. The improvement in the provincial economy was reflected in an increased demand for electrical power. As the province's main producer of electricity, Ontario Hydro is responsible for meeting that demand.

It is a responsibility we take very seriously, and a job we do well. Ontario Hydro has been successfully meeting Ontario's electricity demand for over 79 years. Our rates remain among the lowest in the world, our service is reliable, and our commitment to high safety and environmental standards is firm.

The system we have in place now, with the addition of Darlington, and the much-needed transmission facilities in eastern and southwestern Ontario, will meet electrical energy needs in the short term. However, Ontario Hydro must also ensure that the province has the electrical energy it needs in the longer term.

For the last 15 years, growth in demand for electricity has outpaced economic growth. Our forecast for annual load growth to the end of the century is 2.6 per cent. Yet, this year our actual growth was over 3 per cent. And it appears that electricity consumption will continue to increase. In fact, global electricity generation is expected to double by the year 2000. So sound management principles dictate that we start planning now to secure Ontario's energy future.

Electricity is not Ontario's only energy option but it is quickly becoming the province's most attractive one. There are good reasons for its emergence as Ontario's preferred energy.

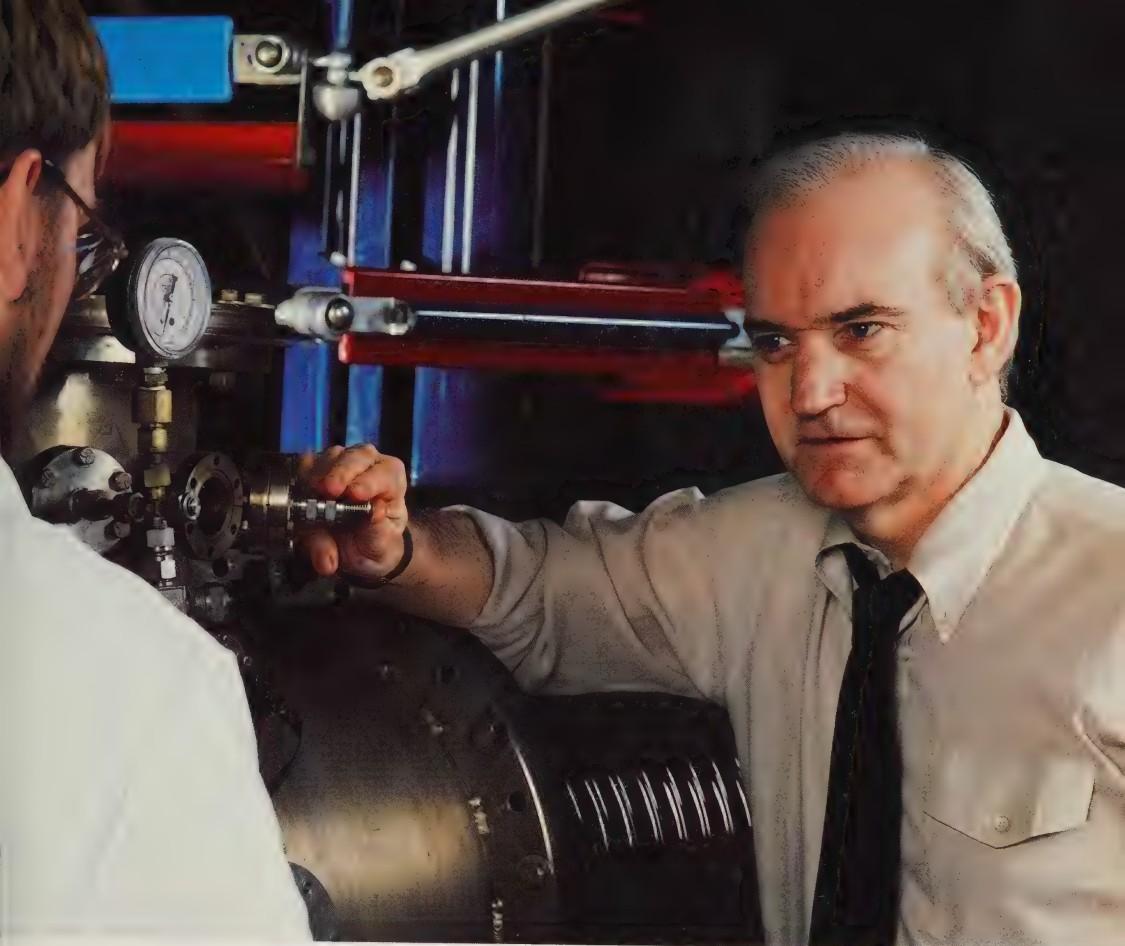
First, electricity is primarily a made-in-Ontario form of energy. Ontario Hydro meets over two-thirds of the province's electricity demand with a blend of hydraulic and nuclear generation. Using Ontario's abundant stock of water and uranium protects the province from fluctuations in the cost and availability of imported forms of energy. The remaining one-third of Ontario's electricity is produced from coal.

As well, electricity is more versatile and controllable than other energies. This property makes electricity ideal for electrically-intensive processes. Some of Ontario's major industries, such as pulp and paper or iron and steel, are finding more and better uses for electrical energy. As Ontario shifts toward an economy shared increasingly by high-tech industries, the application of these and other electro-technological processes becomes vital to keeping provincial industries competitive.

Ontario Hydro is not just in the business of producing electricity. By keeping rates low, we provide an underlying support for the whole provincial economy. A stable and low-cost electricity supply encourages an attracts new investment.

So there are many reasons why electricity will continue to be the province's preferred form of energy and why Ontario's economic well-being will depend on a secure supply of electricity. These reasons emphasize the need to start planning now for electricity requirements beyond the 1990s.

This year has brought us closer to defining future electricity require-



nts and identifying the choices we have to meet those needs. We are studying both supply and demand options to determine the direction our electric planning should take. Whatever that direction, our customers will play a major role in helping us evaluate the options; their participation is key to our planning decisions. As always, our commitment to our customers goes hand in hand with our commitment to an affordable, reliable and safe electricity system.

The most important asset we at Hydro have is our people. Their experience, dedication, and hard work will be essential in the coming years as they have always been. I'd like to thank all employees for their contribution during 1985. I would also like to thank the Board of Directors for their guidance, and the municipal electrical utility associations, together with their representative organizations, for their cooperation

and support in serving the electricity consumers of Ontario.

I would like to extend a very special thanks to Hydro President Milan Nastich, who retired from the Corporation this year after a remarkable 37-year career with Ontario Hydro. Milan Nastich's foresight and sound leadership proved invaluable to the Corporation. He leaves an outstanding record of achievement.

Finally, I would like to welcome Milan Nastich's successor, Robert C. Franklin, appointed President by the Ontario Hydro Board of Directors, effective February 3, 1986. Mr. Franklin comes to Ontario Hydro with many years of experience in a large public service company: he served as President of CN Enterprises, Executive Vice-President of CN Railways, and Chairman of the Board of CNCP Telecommunications.

The diffuser-discharge tunnel constructed at the Darlington Nuclear Generating Station will hold the warm water discharged from the station before entering the lake. While in the tunnel, the discharged water mixes with lake water which seeps into the tunnel through specially designed outlets, thus further protecting the shoreline environment.



Ontario's electricity supply system was built on water power. But the potential for additional hydraulic developments that can produce electric power at a reasonable cost is limited. Even so, there are some possible hydraulic sites left, particularly in the north. The Little Jackfish River (above), which flows into Lake Nipigon, is one example. This year Hydro authorized studies of three locations, including this one, to determine whether they are suitable for further development. If Little Jackfish proves suitable, a generating station could be in place there by 1993. Recognizing our responsibility for meeting future energy needs, Hydro is working to identify and develop other hydraulic sites.

Changing with Ontario

In 1985, more clearly than ever before, Ontario Hydro remained a corporation responding to the changing needs and priorities of Ontario's citizens.

As the province's economy recovered from the recession of the early 1980s, demand for electricity started to pick up. And that trend continued during 1985. Primary sales of electricity—that is, delivery of energy to Ontario customers—climbed 3.1 per cent in 1985. This is consistent

with the 3.2 per cent average annual energy growth during the last five years. Fully 116 billion kilowatt-hour of electricity were delivered to provincial consumers.

Ontario Hydro's rural retail system experienced a growth of over 15,000 customers in 1985, bringing the total number of customers now served to almost 800,000. This two per cent increase is the largest in almost 10 years and continues the trend of the last four years.

Ontario Hydro also provides electricity, by means of diesel generators, to many remote northern Ontario communities which are isolated from the provincial electricity grid. A total of 18 remote communities, generally populated by native people, were served in 1985 in accordance with conditions agreed to by Ontario Hydro, with financial support from the provincial and federal governments.

Hydro also sold power to neighbouring utilities, chiefly in the United States. Revenues from these secondary sales help to keep rates low in Ontario.



they strengthen Canada's balance of payments. In 1985, Hydro earned \$5 million from electricity exports of 6 billion kilowatt-hours.

In all, Hydro delivered 124.6 billion watt-hours of electricity to its primary and secondary customers. Along with the total consumption of electricity, peak demand also peaked in 1985. Lower-than-normal summer temperatures meant that demand for electricity reached record heights. Consumption records were surpassed three times during the month. The December 18 peak demand of 0.5 million kilowatts was well above the 1984 record of 18 million kilowatts. This is the largest absolute increase in load in Ontario Hydro's history.

Nuclear energy accounted for an unprecedented 39 per cent—or 48.5 billion kilowatt-hours—of Ontario's electricity. Ontario Hydro will rely increasingly on nuclear energy in the coming years as new units now under construction are completed. In fact, we expected that two-thirds of

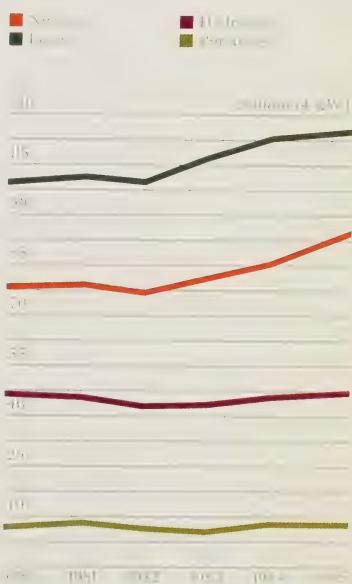
Ontario's electricity will be generated by nuclear energy in the 1990s. By lessening the province's reliance on fossil fuels, CANDU plants contribute to reducing acid gas emissions. These units also help keep rates low, since a kilowatt-hour of electricity from nuclear generation costs 2.92 cents, compared with 3.91 cents from a coal unit.

The Corporation also depended on two other major sources of generation—hydraulic and thermal.

Hydraulic energy is Ontario's least-cost source of generation, at about 0.82 cents per kilowatt-hour. In 1985, hydraulic stations supplied 30 per cent of the total energy generated. In absolute terms, water power accounted for 37.4 billion kilowatt-hours in 1985.

Hydro's coal-burning plants provided 24 per cent, or 29.9 billion kilowatt-hours, of Ontario Hydro's generation in 1985. Thermal stations retain an important place in Hydro's planning because they provide the system with much-needed flexibility. They can be brought on-line in a matter of

Energy Made Available





hours, and they supply crucial "peaking power" during the coldest months.

Finally, Hydro bought power from other utilities, most of it from Quebec and Manitoba. These purchases provided 7 per cent of Hydro's electricity requirements, or 8.8 billion kilowatt-hours, at a cost of \$163 million. This purchased electricity helped reduce Hydro's dependence on costlier fossil-fuelled plants.

Although Hydro is currently winding down a period of major construction activity, we continue to provide a significant number of direct and indirect jobs in that field. In 1985, we provided 9,000 person-years of construction labour and 4,800 person-years of project management and engineering. These figures are expected to decline in coming years as Hydro's building program winds down.

New contracts for goods and services fell from \$816 million in 1984 to \$722 million in 1985. Roughly 82 per cent of these orders were placed with Canadian companies, chiefly in Ontario. However, the value of goods

and services that Hydro purchased in 1985 rose by \$67 million to \$977 million.

Hydro's net borrowing has also declined as construction activity declines. Between 1982 and 1985, gross borrowings dropped from \$2,805 million to \$1,781 million, while net borrowings fell still more sharply, from \$2,172 million to \$757 million. This trend toward lower net borrowing should continue into the 1990s.

All of these considerations—growing reliance on nuclear energy, downsizing, diminished building activity, and lower net borrowing—will help Ontario Hydro to keep rates affordable during the coming years.

In 1985, the Corporation initially proposed an average increase of 3.6 per cent for 1986, while the Ontario Energy Board recommended 4.9 per cent. The final figure—4.0 per cent, which was approved by Hydro's Board of Directors in October—represents the lowest rate increase in 20 years for municipal utilities, and the lowest for direct industrial customers in 14 years.

On May 31, 1985, a tornado tore through central Ontario, devastating parts of Barrie, Grand Valley, Orangerville, Alliston and Tottenham. Several transmission towers in the area were ripped from the ground. Hydro crews worked round the clock to restore power to most of the affected customers within two days.

Hydro's effort to keep rates low also helps make Ontario an attractive place for industrial development. Electricity rates in this province are among the lowest in the world, well below the charges for a kilowatt-hour in Germany, France, and Sweden, and less than half the levels in Japan and many U.S. cities.

1985 Highlights

In the spring, Hydro and the Ontario Hydro Employees Union (OHEU) were unable to reach a satisfactory settlement of contract negotiations. As a result, early in May, the 15,000 employees represented by the union went on strike. It was the first such job action since 1972, and only the third in the corporation's 79-year history.

A new agreement, calling for a presumption of work and a process of mediation and arbitration of outstanding issues, was reached 12 days after the strike began. Both sides then signed a two-year collective agreement. The provincial arbitrator subsequently awarded OHEU members a 5 per cent pay increase and strengthened the provisions for job security.

On Friday, May 31, Ontario Hydro faced another challenge—a series of tornadoes that levelled homes and power lines in central Ontario. The storm toppled four towers on the Bruce-to-Milton 500-kilovolt line and two towers on the 500-kilovolt line between Essa and Claireville, as well as towers on two 230-kilovolt lines and poles on countless low voltage lines.

Emergency control centres were set up in Head Office and in the Georgian Bay, Central and Western regions to coordinate the movement of employees and materials. Employees worked round the clock in these regional and area offices, as well as at Hydro's Poling Complex, to keep supplies

Parallel generation could make a small but significant contribution to meeting the province's future energy needs. Private generators who produce electricity for their own purposes could be encouraged to sell some of the electricity they produce to Ontario Hydro. In some cases, private generators may wish to sell their total capacity. A recent increase in the rates Hydro pays for parallel generation has made this option more attractive for individual developers. At this small hydroelectric development near Dundas (below), Ontario Hydro helped a private developer finance the interconnection of his system to our distribution lines.

moving to the stricken areas. Within days, wooden pole bypasses had been erected and service restored to most customers. Hydro's staff also contributed very generously to a Tornado Relief Fund.

The sudden, massive damage caused by the storms triggered the first operation of the new Bruce Load and Generation Rejection (LGR) System Protection Plan. This automated control plan, in service since March 7, was designed to deal with loss of the Bruce-to-Milton 500-kilovolt line. Whenever both circuits of that transmission line are unexpectedly removed from service simultaneously, the LGR system immediately cuts off up to four of the Bruce generators and up to 1,500 megawatts of customer load to protect the integrity of the interconnected transmission grid and limit the extent of customer interruptions. On May 31, the plan served its purpose well.

Later in the year, Ontario Hydro responded to Massachusetts Electric's appeal for assistance in dealing with the aftermath of Hurricane Gloria. The September storm downed power lines throughout New England and left more than 100,000 consumers in that part of the U.S. without electricity. With less than 12 hours' notice, Hydro sent 20 line crews and five forestry crews south. Putting in 16-hour days, Hydro employees helped restore power in both Massachusetts and Rhode Island.

During September and October, the provincial Select Committee on Energy held hearings on the Corporation's plans and activities. Twenty-one individuals from Ontario Hydro appeared before the Committee, as did 102 other witnesses representing a broad range of groups and viewpoints. In all, Hydro committed internal resources in excess of 8,000 hours to this task in 1985.



Ontario Hydro officially opened Atikokan Generating Station, on November 27, 1985. Atikokan burns low-sulphur coal (lignite). The 200-megawatt unit increases generating resources in the northwest by 20 per cent. It also boosts the region's self-sufficiency, which in turn makes northwestern Ontario more attractive to industry.

*O*ne of the primary disadvantages of coal is the acid gas emissions it creates. While Hydro's current emission control program includes greater reliance on nuclear power and increased purchases of hydroelectric power from neighbouring utilities, it also emphasizes using pre-washed and low-sulphur coal in our coal-fired plants. Several new coal technologies, including Hydro's experimental limestone injection scrubbers at the Lakerview Generating Station, are being investigated and tested. To play a larger role in meeting future energy needs, coal plants would have to burn low sulphur fuel or be equipped with state-of-the-art emission controls.



The hearings focused on the future of the Darlington Nuclear Generating Station. Hydro's management and employee representatives welcomed the opportunity to discuss Darlington's role in Ontario's future electricity supply. Even if demand were to grow as slowly as one per cent a year, Darlington would still be needed to meet power demands economically in the 1990s. The Committee was told that cancellation of two of the four units would significantly raise electricity rates, as well as increase acid gas emissions.

In December, the Select Committee issued an interim report with three recommendations. The first two called for a closer examination of the relationship between the provincial government and Hydro, and a further review of Hydro's options for meeting future energy needs. The third recommendation urged that contracts for Darlington units 3 and 4 only be awarded for materials required for construction during the next six months while the desirability of continuing construction could be more thoroughly assessed. The Committee's final report is expected in mid-1986.

Coal's Continuing Contribution

Coal-fired stations provide Ontario Hydro's generating system with an important element of flexibility. For example, on several days in January 1985, coal-fired plants supplied more than 40 per cent of power during this peak period when cold weather and shut-down nuclear units put severe pressure on Hydro's power resources.

In November, the Corporation placed in service a new coal-fired plant, Atikokan Generating Station, located 225 kilometres west of Thunder Bay. This \$748-million, 200-megawatt facility is capable of supplying 20 per

cent of northwestern Ontario's electrical needs. It also increases the reliability of the local power system.

Construction of this plant strongly benefited the local economy which had been severely affected by the closing of nearby iron mines. Many local workers were hired over the course of seven years to build the station. Fifty-five people are employed full-time to operate the plant.

Hydro and the Ministry of the Environment are committed to protecting the air, water, and land around the Atikokan station. Continuous monitoring of air and water will ensure that acidic emissions are low and discharge water meets all regulations. Low-sulphur Canadian lignite is burned to help reduce sulphur dioxide emissions, and fly ash collection systems eliminate 99.5 per cent of particles from the gases before they enter the stack.

Hydro's Acid Gas Reduction Strategy

Hydro is committed to reduce sharply the level of acid gas emissions from our coal-burning stations. The chief objects of concern are sulphur dioxide and nitrogen oxides, which are created during the coal combustion process. In 1985, total emissions from Ontario Hydro's coal-fired stations were about 400,000 tonnes, a significant decline from the 1984 total of 519,000 tonnes.

In December 1985, new regulations were issued by the provincial government. The limit in and after 1986 was reduced from 450,000 to 430,000 tonnes, the limit in and after 1990 was reduced from 300,000 to 280,000 tonnes, and the limit in and after 1994 was reduced from 300,000 to 215,000 tonnes. This directive puts increasing pressure on Ontario Hydro to meet the new emission limit in a reliable and cost-effective way, but v



confident that we can meet this target successfully.

The Corporation is exploring several approaches to reducing acid gas emissions while continuing to provide reliable and affordable power to Ontario's citizens. Increased use of nuclear

energy is one part of the solution. A key element in Hydro's reduction strategy is reliance on our CANDU nuclear units—those now in operation and those under construction at Bruce and Darlington—and hydraulic stations to meet the bulk of Ontario's electricity requirements. As well, Hydro is exploring the possibility of increased purchases of electricity from neighbouring utilities in the 1990s.

Controlling the sulphur content of coal burned is another part of our reduction strategy. Hydro washes most of the bituminous coal used to remove trace sulphur. Low-sulphur, western Canadian, bituminous coal is blended with high-sulphur, higher-combustibility American coal at Nanticoke Thermal Generating Station. This blending achieves the required combustion

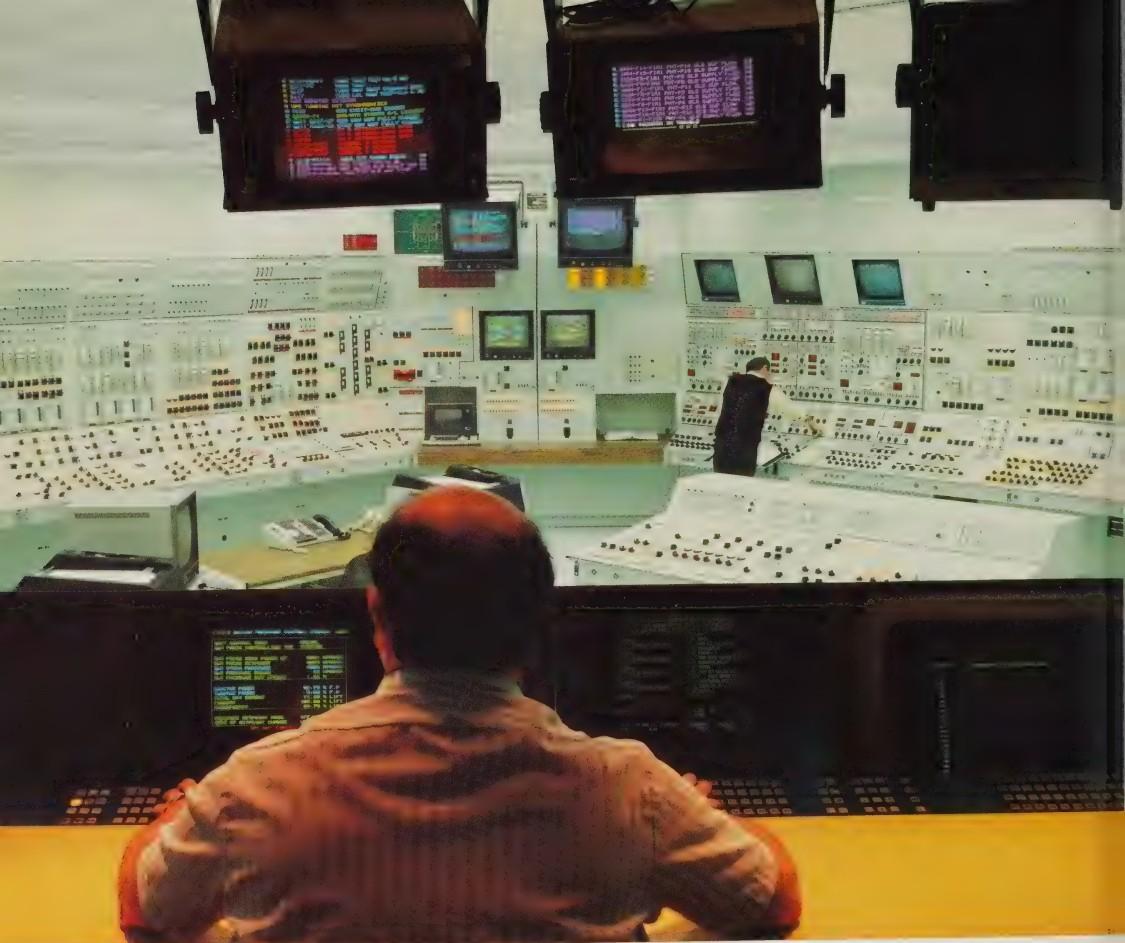
characteristics for which the Nanticoke units were designed. These steps already have had an impact. In the last 10 years, the average sulphur content of the coal Hydro burns has decreased to 1.6 per cent from 2.4 per cent.

Hydro carried out preliminary tests during 1985 on limestone injection scrubbing at one 300-megawatt unit at its Lakeview Generating Station. In this process, powdered limestone is blown directly into the furnace where it combines with the sulphur dioxide to form calcium sulphate, which is then collected with the ash. This approach promises to be less expensive than the installation of flue gas scrubbers. Initial results of removal of up to 40 per cent of the sulphur dioxide are encouraging, and efforts to improve this process will continue in 1986.

The Corporation is also working with the Tennessee Valley Authority (TVA) in the United States on the development of a lime spray dryer system to reduce sulphur dioxide in

Acid Gas Emissions





the flue gas. Tests should begin in the fall of 1986 at TVA's Shawnee Power Plant.

Other efforts have focused on the reduction of nitrogen oxide emissions. In 1983, a burner modification program was tested on Nanticoke units 5 and 6. These two units were fitted with low-nitrogen oxide burner nozzles. As a result, nitrogen oxide emissions were lower; however, the modifications also decreased efficiency and increased particulate emissions. Further testing in 1985 solved these problems so that satisfactory boiler efficiency has been attained, the particulate emissions have been eliminated, and a 30 per cent reduction of nitrogen oxide emissions has been reached.

Ontario's Hydraulic Resources

Since the establishment of Ontario Hydro in 1906, water power has been the cornerstone of Ontario's electricity supply and continues to provide much of the province's electrical energy.

While the potential for increasing

the role of hydraulic power is limited, several developments in 1985 marked the Corporation's continuing involvement with hydroelectric power. A program was instituted to check the safety of all 280 dams that Hydro operates, as the average age of these structures is 50 years. Such an assessment is one of our safety priorities. The complete inspection of these facilities is expected to take seven years.

Hydro's Board of Directors also approved the study of three possible sites for the development or redevelopment of hydroelectric stations.

A new station on the Little Jackfish River, which flows into Lake Nipigon in northwestern Ontario, could be in service by the end of 1993. The existing hydraulic stations on the Mattagami River in northern Ontario are a second area of interest. Extensions and redevelopment of these stations could produce 856 megawatts of electricity, almost double their present capacity. Finally, Hydro is investigating the possibility of replacing some of the older facilities at Niagara Falls with

The success of Ontario Hydro's nuclear program is due partially to the comprehensive training that nuclear operators receive. The nuclear training simulator, located at Pickering, is an exact replica of the station's control centre. Here, operators-in-training can get some hands-on experience in running a nuclear plant.

new 540-megawatt generating station during the 1990s to increase energy output.

Hydro's Commitment to Nuclear Energy

The success of Hydro's CANDU reactors over the past 20 years is a strong endorsement of Ontario's nuclear program. These units have performed more reliably and efficiently over their lifetime than any other type of reactor. At the end of 1985, five Ontario Hydro CANDU reactors ranked among the top ten performers in the lifetime capacity factor category in a rating of 212 reactors worldwide.

Hydro's busiest construction site in 1985 was the Darlington Nuclear Generating Station. Darlington started the year with fewer than 4,000 construction workers and by year's end had almost 6,000 on site. Activity concentrated on units 1 and 2, whose in-service dates are 1989 and 1988 respectively. All four 365-tonne steam generators for unit 2 were put in place this year.

At Hydro's Bruce station, unit 5 went into commercial service in March, one month earlier than forecast. In July, units 5 and 6 were upgraded from 845 megawatts to 865 megawatts, and later in the year to 885 megawatts. Unit 7 neared completion in 1985 and is expected to be placed in service by April 1986.

At Pickering Nuclear Generating Station, unit 7 was declared in service in January. Unit 8 was nearly ready to go into commercial operation at year's end.

Pickering Retubing

The retubing of Pickering units 1 and 2 continued during 1985. These reactors remained shut down, as they have

As a heavily industrialized province, Ontario has considerable potential for cogeneration. This process can combine the production of both electricity and steam heat from a single fuel source. It is particularly attractive if that fuel is a waste product. Hydro is exploring which incentives are most effective in encouraging more industrial cogeneration because it could provide the province with an additional source of generation for the future. For example, we recently signed an agreement with Chapleau Cogeneration Limited to buy electricity produced from the wood waste of local lumbering operations. Previously, this wood waste was simply transported to cone burners (below) and burned off.

been since 1983 when a cracked pressure tube was discovered in unit 2. The Zircaloy-2 tubes used in units 1 and 2 are being replaced with zirconium-niobium tubes, the type used in all of Hydro's other reactors. Hydro expects to have both units back in service in early 1987.

Nuclear Safety a Priority

Safety has always been a priority in Hydro's nuclear program. Hydro's CANDU reactors are designed with multiple barriers so that if a problem does emerge, such as a cracked pressure tube, the public is still protected. Radiation levels near the nuclear stations are carefully and continually controlled and monitored.

Hydro has also worked steadily to further improve the safety and working conditions of our nuclear operating staff. Although the level of radiation exposure has always been well below federal government limits, the total amount of radiation received by nuclear operating staff and contractors in 1985 was the lowest it has been since 1968.

Ontario Hydro's nuclear operating staff extended its safety record to more than 100 million hours and 30 years worked without an on-the-job fatality.

Finally, the construction of a tritium removal facility at Darlington continued. Tritium, which is an isotope of hydrogen, accounts for a significant portion of the radiation dose to nuclear workers. This substance gradually builds up in the heavy water systems of operating units. The removal facility is designed to isolate and extract tritium from the heavy water, substantially reducing the radiation exposure. The facility is scheduled to begin operation in May 1987.



R-2000 homes are built to a high energy efficient standard. They have extra insulation, vapour barriers and a special ventilation system that controls humidity and includes a heat-recovery device. R-2000 homes can save up to 75 per cent on heating costs over a conventionally-built house. These homes, now under construction in a Mississauga development, are all-electric.

More generating capacity is needed in peak periods of electricity use than non-peak periods. By shifting some of that peak load, we can reduce the need to build new generating plants. In the short term, using more off-peak electricity can result in considerable cost savings for customers. The challenge is to design load management programs and equipment that provide adequate incentives for customers to change their pattern of electricity consumption. Digital load management programmers can monitor and control electricity consumption (below) so that some loads can be automatically shifted to off-peak periods. This type of system has a lot of potential for apartment and commercial buildings.

Other Sources of Energy

While coal, hydraulic, and nuclear power remain the primary sources of Hydro's current electricity supply, the Corporation is actively exploring a broad range of other options. The rapid pace of technological change suggests that energy sources that are prohibitively expensive now may be attractive for special applications in the future.

For the past several years Ontario Hydro has been investigating the possibility of producing electricity from sunlight. In 1981, Hydro constructed a stand-alone photovoltaic system north of Atikokan to power an air quality monitor. In 1984, a solar cell system was erected at the Kortright Conservation Centre near Toronto. On sunny days, these cells satisfy specific local needs and can supply the Township of Vaughan with up to one kilowatt of power.

This past year, Hydro tested several different solar arrays at Kortright, as part of the preparations to install a 10-kilowatt photovoltaic unit at Big Trout Lake in northern Ontario. This remote community receives 85 per cent as much sunshine as Florida. At present, its needs are supplied by generators that run on costly diesel fuel. By contrast, the price of solar cells has been dropping. For example, in 1981, solar units cost five times as much as they do now.

For Ontario, wind-generated electricity appears practical only in a few northern communities where wind currents are strong and the cost of alternative power sources is high. In 1985, Hydro began a project to install a 60-kilowatt wind turbine in Fort Severn, the northernmost settlement in the province. The foundation and the instrument building have been erected, and the turbine is now being

tested in Scotland. The complete unit will be installed at Fort Severn in the summer of 1986.

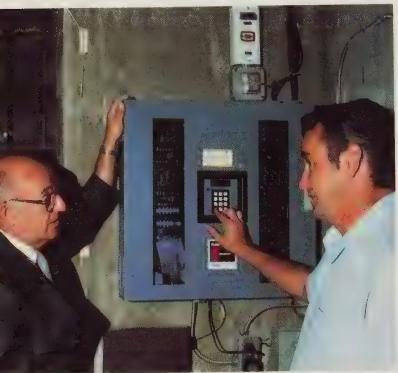
Fusion power is another area that holds great promise but is still in the experimental stage. Ontario Hydro is the operating manager for the Canadian Fusion Fuels Technology Project. In 1985, Hydro was responsible for overseeing a budget of \$4 million and coordinating the activities of more than 25 organizations. Collaborative agreements have been signed with Japan, the United States, and the European Economic Community.

New Initiatives in Energy Management
Cogeneration is another way of meeting a portion of Ontario's electricity needs. It is the simultaneous production of two energies – usually electricity and steam – using a single fuel source. Typically, cogeneration involves an agreement by Hydro to purchase electricity from a firm that has been producing heat or power for its own use only. Ontario benefits from the installation of about 500 megawatts of industrial thermal generation and another 600 megawatts independently-owned hydraulic generation, chiefly in the pulp and paper, chemical and mining industries.

To promote cogeneration, Ontario Hydro increased the rates at which we buy electricity by 50 per cent in 1985. This has made cogeneration a more attractive prospect for potential cogenerators. For example, Hydro signed an agreement this year with Chapleau Cogeneration Limited. The firm will produce electricity, made from the waste wood of local lumbering operations, and sell it to Hydro.

During 1985, Hydro continued its research into effective conservation initiatives.

This year saw some encouraging





ults from a five-year experiment to determine customer attitudes to time-use rates. In this experiment, 500 residential customers have been testing rate structures with varying peak and off-peak periods and corresponding prices. While still early in the experiment, these preliminary results are positive. For example, demand during Hydro's busiest hours decreased on average by 4 per cent, while energy used during other periods rose by the same amount. Seventy per cent of the householders involved in this experiment reported that they were pleased to be able to trim their bills by changing consumption patterns.

This shift in load is significant because it can reduce or defer the need to build new generating capacity. Even a 2 per cent shift of peak demand to off-peak can represent one per 500-megawatt generating unit. In a different series of load management experiments conducted in Markham and Scarborough during 1985, Hydro explored other means of curbing peak consumption through

more energy-efficient applications. For example, ceramic brick furnaces, which store thermal energy, allow commercial customers to shift much of their electrical use away from the periods of highest demand. On the residential side, the addition of a second water heater means that a utility can control up to 16 hours of a home's water heating load. The most important finding of these experiments is that, by and large, consumers reacted favourably to direct utility control of domestic hot water supplies and electric furnaces.

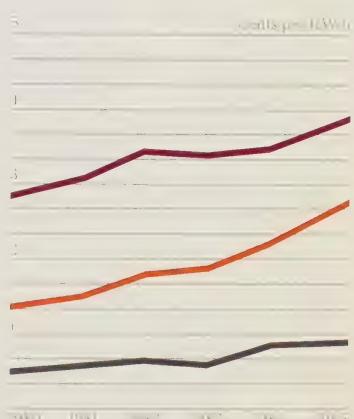
Finally, Ontario Hydro has continued to pursue more traditional approaches to conserving electrical power. Ongoing programs such as the Residential Energy Advisory Program (REAP) promote the use of more efficient lighting, appliances, and home heating.

Hydro's Transmission Network

Ontario Hydro's generating stations are only one part of the supply system. A comprehensive transmission network

Average Cost of Generation

- Nuclear
- Hydro
- Fossil





to move the power from its source to the consumer is the other requirement. Moreover, the grid formed by the province's transmission and distribution lines gives the system its flexibility, allowing power produced in one part of the province to be delivered to wherever it's needed. These lines also make possible the exchange of electricity with neighbouring utilities.

Ontario Hydro recognizes that, along with this need for the transmission of power, there must be a strong concern for the environment and for the interests of individuals living near the path of high-voltage lines.

During 1985, Hydro began work on a 230-kilovolt line linking the Hamner Transformer Station, near Sudbury, with the Mississagi Transformer Station, located about 75 kilometres from Sault Ste. Marie. The line is essential to meet demand in the Algoma and Sault Ste. Marie areas. It will also strengthen the reliability of supply to customers in northwestern Ontario.

Because the Hamner-Mississagi

line runs through some of northern Ontario's most rugged terrain, Hydro engineers have taken an innovative approach to its construction. Towers are being assembled at 17 locations along the 208-kilometre route, and will be flown to their sites by helicopter. This line should be operating by December 1987, and current plans suggest that it will be upgraded to 500 kilovolts sometime in the 1990s.

Work also commenced during 1985 on a 500-kilovolt line connecting Bowmanville and the Cherrywood Transformer Station near Pickering. This project follows a previously acquired right-of-way and will be in service by March 1987.

Much-Needed Additions

In 1985, we continued our efforts to determine acceptable routes for two 500-kilovolt transmission systems that are urgently needed.

One set of these Extra High Voltage (EHV) facilities is planned for southwestern Ontario, and will connect Bruce Nuclear Power Development

transmission lines unlock and deliver the power produced at the various generating stations across the province. Today, Ontario Hydro maintains and operates more than 30,000 kilometres of transmission and distribution lines. A comprehensive transmission network is the key to a flexible electricity supply system.

with the Barrie area to the east and with the London area and the Nanticoke Generating Station to the south. Once installed, these facilities will allow full use of the low-cost nuclear power produced at the Bruce station.

As early as 1980, a royal commission declared that it was "indefensible" for power to be bottled up at the Bruce station. In order to determine an acceptable route for the proposed transmission line, Hydro conducted numerous public information seminars in the potentially affected areas. As well, route plans and environmental studies were reviewed by government ministers and submitted to the government-appointed Joint Board, under the Consolidated Hearings Act. The process was slowed in 1984 by a Divisional Court decision that adequate public notice of the proposal and the hearings had not been given. However, a new environmental assessment was filed with the provincial government in August and new hearings are now in progress on Hydro's most recent proposal. The delay resulting from this Court decision will have a substantial impact on the cost of power in the late 1980s. Without the transmission facilities in place on schedule, higher cost coal-fired power will have to replace much of the power that would have been transmitted from Bruce.

Hearings also continued during 1985 on much-needed transmission facilities in eastern Ontario. In this instance, the planning and approvals process, which began in the mid-70s, appears to be reaching a conclusion. The Ontario Supreme Court and the Joint Hearings Board have issued favourable rulings, and a decision by the Cabinet is expected early in 1986.

*O*ntario Hydro currently imports power during emergencies or when the cost of purchased power is less than what it would cost to produce it on Ontario Hydro's system. Purchasing guaranteed power from neighbouring utilities is an option we might pursue on a larger scale in the future. In fact, considering the hydroelectric resources in Quebec and Manitoba, we could have access to several thousand megawatts of capacity. For any long-term firm purchase arrangements of this size, however, we would need additions to our provincial interconnections as well as our transmission network within the province.

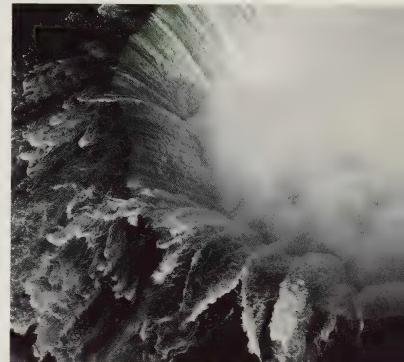
Hydro's People

People remain the Corporation's most valuable resource. Hydro's corporate strategy, implemented in the early 1980s, presented a real challenge to Hydro and its employees. This strategy called for a shift within the Corporation from an emphasis on construction to a more flexible, customer-oriented organization. This shift meant a substantial downsizing of staff in the design and construction side and some staff and resources moved to the customer side of the Corporation. As a result, the total number of regular employees has stabilized at just over 23,000 in 1985, from a high of 25,249 in 1982.

Hydro has made a strong effort to find positions for employees displaced by changing priorities. This redeployment program has been remarkably successful. In 1985, 96 per cent of those whose jobs were discontinued were transferred to other jobs within the Corporation.

Hydro also launched a program to improve working relationships. The first step in this project was getting together a team of human resources specialists who report directly to Hydro's Senior Executive Vice-President, Pat Campbell. This team interviewed over 700 employees from all branches. A report with recommendations is expected in the early spring of 1986.

Personnel officers, line managers, and other individuals devoted considerable energy in 1985 to one of Hydro's long-standing concerns—human rights. Over 2,000 employees were involved in nearly 100 training sessions touching on such topics as discrimination in the workplace and services for the handicapped. A regular newsletter reinforced these efforts.



On August 22, 1985, the Hydrokids Day Care Centre officially opened. The centre can accommodate a total of 54 infants, toddlers and pre-schoolers.

Current alternate sources of energy are not suited to make substantial contributions to our future electricity supply. But they will play an important role in specialized applications. For example, solar cells, which convert sunlight directly into electricity, could prove useful in remote northern communities where the alternative is even more expensive diesel-powered generators. Wind generation is also an alternative that has some potential for use in the north. Another option, burning municipal solid waste (MSW), could provide up to 300 megawatts by the year 2000. Although municipal waste is not a high-grade fuel, this process has the dual advantage of waste disposal and electricity production.



Affirmative Action

Ontario Hydro strengthened its commitment to affirmative action in 1985. This program seeks to provide men and women with the same job opportunities and choices.

Seventeen per cent of Hydro staff are women. They make up 7 per cent of the management and professional staff, and 2 per cent of the executive group. By contrast, females occupy 79 per cent of all clerical positions in the corporation. Of the more than 11,000 jobs in trades and technical area, only 200 are held by women.

The corporate affirmative action program sponsored a broad set of recruiting, training and development initiatives to encourage the promotion of qualified women into management and into non-traditional areas. Career planning and development for clerical and secretarial staff were also emphasized. Individual affirmative action programs were established within each branch, and line management from each branch made responsible for the success of these programs.

One barrier to female employment fell when the Atomic Energy Control Board revised the regulations that had prohibited women from holding the full range of atomic radiation workers jobs available at Hydro's nuclear generating stations. Hydro played a significant role in bringing about this change. Six women are now in a training program that will lead them to previously restricted jobs within the atomic radiation workers zone. As well, 15 of 80 employees hired as electrical operators in 1985 were women. And during 1985, the first woman was admitted to the lineman training program.

Day Care Available at Hydro

The pressures on many working

parents at Hydro were eased by the introduction of workplace day care. Hydrokids Day Care Centre was opened in the fall of 1985. This centre is the result of the initiative of a group of employees who worked along with senior management over the past few years to make the concept a reality. Hydrokids currently has space for 54 children, including spots for 10 infants.

While operating costs will be covered by the parents using the centre, Hydro and the Ontario Ministry of Community and Social Services provided grants to establish this important facility.

Health and Safety

Ontario Hydro's concern for employee health and safety stretches back to the Corporation's earliest days. During recent years notable strides have been made, and 1985 was no exception. For the first time ever there were no on-the-job fatalities or permanent total disabilities among Ontario Hydro's regular staff.

Moreover, the 19,967 days lost because of accidents amounted to only 69 per cent of the 10-year average from 1975 to 1984. The number of days lost in the regions continued its remarkable decline to a level that is less than one-tenth of the figures recorded before the end of the 1970s.

A number of Hydro projects addressed themselves to the issue of the staff's health and well-being. For example, the scope of the Employee Assistance Plan (EAP) was enlarged to help workers with their personal problems, well before such difficulties become debilitating. Union as well as management and professional representatives warmly endorsed these initiatives.



Marketing

At Hydro, marketing is not just selling electricity. It is bringing the needs of the customer and Hydro's ability to meet those needs into the best balance. Marketing includes research, customer service, load management and conservation. In short, it means managing the delivery side of the corporation.

Marketing also supports the additional objective of reducing our dependency on oil and non-renewable fossil fuels. And Hydro's efforts reinforce the provincial goal of using energy sources that are indigenous to Ontario.

Hydro began the year with a strong push to persuade homeowners to convert from oil to electric heating before the federal government's Canadian Oil Substitution Program expired on March 31. The final tally of electric heating conversions prompted by this program was more than twice the amount targeted.

Hydro's advertising is aimed at making the public more aware of their

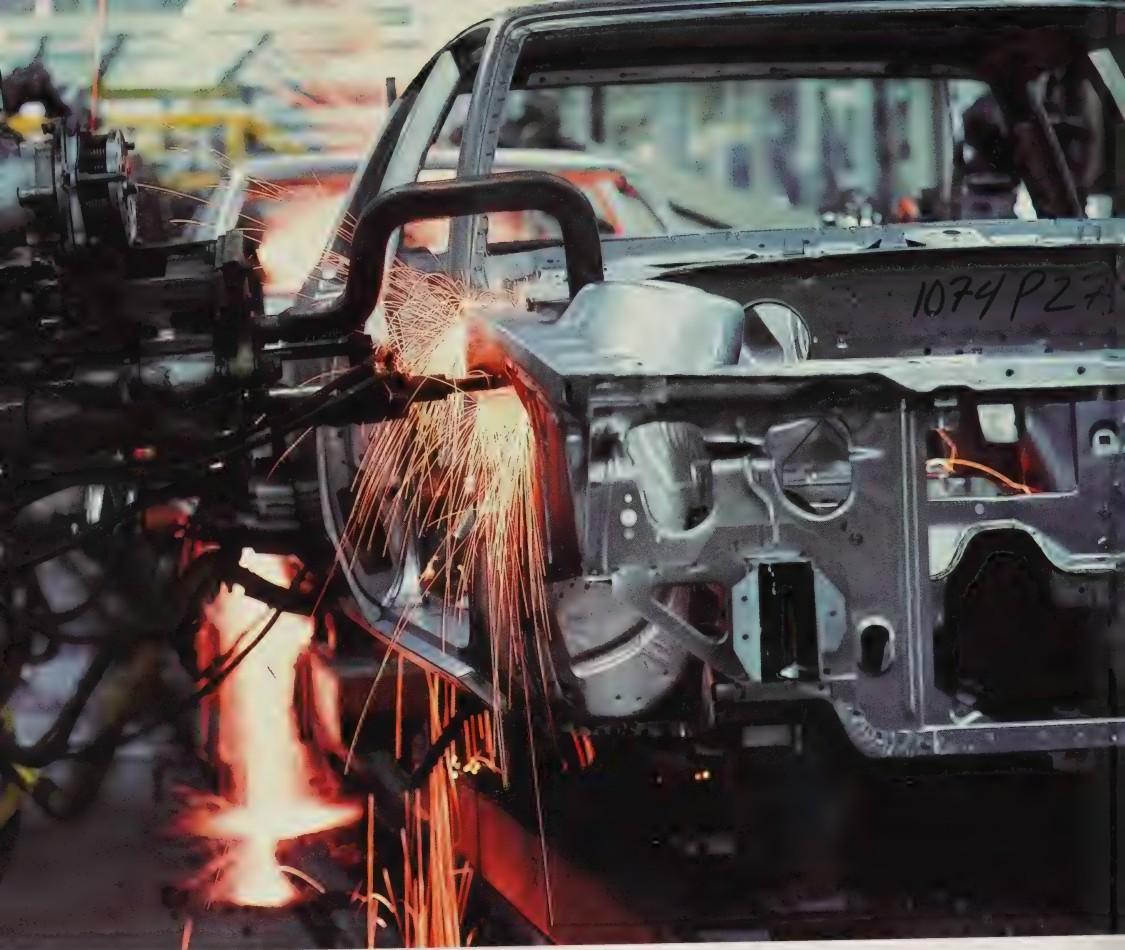
energy efficiency options. One campaign during 1985 emphasized the efficiency and versatility of heat pumps. Another promotion boosted electrical water heating, prominently featuring the 1985 Toronto Blue Jays and their skill in sending opposing pitchers to the showers. Radio and television spots made the message a familiar one to Ontarians. So did brochures that underscored the advantages of electric water heaters.

The Corporation also introduced the EnerMark Loan Plan, a program administered by the Royal Bank to provide financing for up to \$10,000 worth of home energy improvements. All loans are life insured at no additional cost to the customer, and the rates are kept below prime.

One of the constants in Hydro's marketing efforts is improving our service to customers. To this end, we've introduced some initiatives such as providing telephone service for the hearing impaired among our rural residential customers, accelerating our program to extend electrical service to

Comparative Electricity Price for Industrial Consumers (1984)





Ontario's remote communities, and instituting more convenient billing arrangements for senior citizens.

Hydro has been active on the commercial and industrial side as well. A highly successful initiative of 1985 was the production of "The Source", an authoritative information guide detailing electrical design in commercial applications. It includes hundreds of examples of design calculations and general industry standards using both imperial and metric units. Aimed at architects and consultants, it has generated a great deal of enthusiasm in the few months it has been available.

There are a number of opportunities in industry where electricity could be used to greater advantage. For example, during 1985, Hydro worked with the mining sector to promote electric mine air heating. As a result, Canimex Mines and Noranda have installed electric systems in some of their mine sites.

CAE Diecast, a St. Catharines area foundry, installed a third electric furnace for its aluminum melting

operations. In another instance, Hydro and municipal utility staff worked for months with Benn Iron of Wallaceburg, an effort which led to the installation of two electric induction furnaces.

Saputo Cheese Company of Cooktown adopted a mechanical vapour recompression process for concentrating whey in its cheese production operations. Formerly gas-driven, this process is now running on electricity. This state-of-the-art technology will result in a 75 per cent energy reduction.

Many of Hydro's marketing initiatives have grown out of the close working relationship between the marketing and research areas. The development of the cold climate heat pump is one such example. Because most of the heat pumps on market are geared to more temperate climates, the prototype heat pump developed at Hydro is designed to meet the heating needs of colder climates. It is estimated that homeowners can save an additional \$75 to \$150 per

industry is coming more automated, industrial processes are coming more electrically-intense. Electricity, at point-of-use, is even more versatile and controllable than other forms of energy. General Motors in Oshawa is using electricity-dependent robotics in many phases of assembly line operation.

ar with these units. Seven are being installed in homes this winter.

Pursuing New Business Opportunities

ydro's marketing initiatives also extend to business activities related to, but separate from, the production of electricity. These include the sale of electricity by-products such as isotopes and process steam energy as well as energy technology and expertise. The net revenue these activities earn is applied to the cost of electricity in Ontario. And this helps keep rates low. In fact, new business ventures are a rapidly growing component of the Corporation's marketing activities. In 1985, the volume of business in this area tripled with more than 60 contracts worth over \$25 million.

One example of these efforts is the development and leasing of a mobile polychlorinated biphenyls (PCBs) contamination unit. Developed in part by Hydro's research team, this equipment transforms the PCBs found in the insulating oil of electrical transformers into common salt and other harmless by-products. The process allows the oil, a valuable non-renewable resource, to be reused rather than destroyed. Use of the mobile unit on site reduces the need to transport contaminated substances. In 1985, Hydro leased the equipment to Rondar Inc. of Hamilton and this technology will be used across Canada. Many of Ontario Hydro's new business opportunities lie beyond Canada. Our reputation in energy technology is known and respected throughout the world.

During 1985, the Corporation entered a contract to undertake a five-year training program for electrical transmission maintenance workers in Pakistan. The Canadian International Development Agency (CIDA) funds

During the 1970s, Ontario Hydro recognized the benefits to customers of energy conservation. Since that time, conservation has been an important factor in utility planning. It will take on an even larger role in the decades to come. Encouraging electrical efficiency in all sectors - residential, agricultural, commercial and industrial - can moderate the level of future demand. The wise use of electricity may decrease the need to add to our supply system as much or as quickly. Keeping our customers informed of energy-saving programs and products is an important part of Hydro's responsibility to meet the province's electricity needs in the coming years.

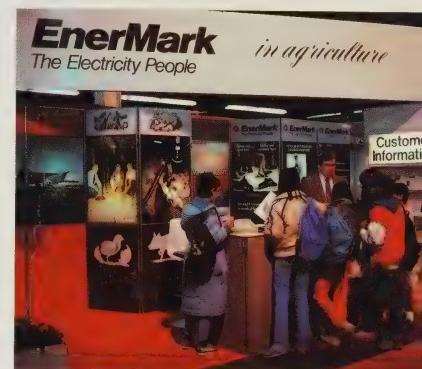
this \$9.8 million program. Hydro has agreed to procure equipment where needed, a provision that should strengthen the commercial ties between Pakistan and Canada and provide significant opportunities for Ontario's manufacturing industries.

Among other examples of the Corporation's international activities is our membership in a consortium that will develop a comprehensive energy policy for Kenya. This East African country is hoping to decrease its reliance on imported fuel, and to alleviate the problems of deforestation, caused by an excessive use of wood for heating.

Finally, Hydro benefited from the sale of three nuclear operator training simulators to American electrical utilities. These sales, which generated royalties of about \$1 million for the Corporation, were the culmination of 11 years of cooperation between Hydro and CAE Electronics Limited of Montreal.

A Responsible and Open Organization
Ontario Hydro's mandate is to supply power at least cost over the long term to the overall benefit of our customers. Accordingly, we are very serious about our commitment to be a responsible and responsive organization accountable to the people we serve. Each year, Hydro devotes significant resources to our communication with customers, elected officials, special interest groups, and the general public.

During 1985, Hydro representatives appeared before a variety of official bodies, including the Ontario Energy Board, the Select Committee on Energy, the Joint Board under the Consolidated Hearings Act, the National Energy Board and more than one standing committee of the provincial legislature. Few enterprises of





The construction of transmission lines seemed to fascinate this young visitor to the Ontario Hydro exhibit at the 1985 Royal Winter Fair. The Corporation's community relations people spend a good deal of time travelling to various local fairs and events to meet and talk to the people Hydro serves.

comparable size receive such frequent and intense scrutiny. The costs incurred by the Corporation for participation in these various processes were more than \$3 million.

As a publicly owned corporation, Hydro is committed to public consultation in the operation and planning of Ontario's electricity system. This year, the Corporation initiated a series of "Hydro Forums". The chairman, president and other senior officials travelled to Thunder Bay, North Bay, London, and Belleville to meet with local citizens and listen to their concerns. More of these events are planned for 1986. Another public consultation program initiated this year involves special interest groups. One hundred and twenty special interest groups were invited by Hydro to discuss Ontario's future energy needs and how they should be met. Two sessions were held in 1985; more are planned for 1986.

Ontario Hydro also operates five information centres across the province for the public. These are located

at the Bruce, Pickering, Darlington, Thunder Bay, and R. H. Saunders generating stations. The newest of these facilities is the Bruce Information Centre. Opened in April, it welcomed almost 4,500 persons during the first three months of operation.

In addition to the formal hearings community relations initiatives and information centres, Hydro is involved in numerous public communications activities. These activities include an expanding French language services program, a busy Speakers' Bureau, and award-winning film production. This year a French language services administrative guide was prepared, 327 speaking engagements were booked through the Speakers' Bureau for community and industry groups across the province, and two Ontario Hydro videos—"Ask Us" and "Comfort Solutions"—won top awards. Another video produced during the year, a five-part, made-for-cable-TV series entitled "Watt's Up—Getting to Know Ontario Hydro", will be aired in 1986.

Financial Section

Financial Review of Ontario Hydro

for the year ended December 31, 1985

Financial Highlights

Ontario Hydro's activities continue to be guided by its corporate strategy for the 1980s. The strategy encourages the efficient use of electricity and emphasizes productivity improvements and cost control.

Ontario Hydro's total revenues for 1985 amounted to \$4,625 million, \$413 million higher than in 1984. Approximately \$78 million of this increase came from a greater volume of electricity sales, and \$335 million from the 1985 rate increase. Total operating costs for 1985, including financing charges, amounted to \$4,265 million, an increase of \$628 million over 1984. The major factor in this increase in total operating costs for 1985 was new generating units placed in service in 1984 and 1985. To partially offset this overall increase, the 1985 electricity rate increase provided for a level of net income lower than the level for 1984. The net income for 1985 was \$360 million compared with \$575 million for 1984.

Cash provided from operations and available for investment in fixed assets was \$1,055 million for 1985. As in past years, this contributed to Hydro being able to lower its borrowings to finance capital expenditures. The capital expenditures for investment in fixed assets during 1985 amounted to \$2,541 million. This represents a steady decline from the 1982 level of \$2,885 million as a result of the decrease in the level of construction activity.

Results of Operations

Revenues

Primary revenues for 1985 amounted to \$4,274 million, an increase of \$491 million or 13 per cent as compared with 1984. Electricity sales to municipal utilities, rural retail, and direct industrial customers totalled 109,215 million kilowatt-hours. The overall growth rate in the volume of primary energy sales was 3.1 per cent for 1985, reflecting the effect of continued economic growth in the Province of Ontario, as well as weather conditions. In 1985, electricity sales to municipal utilities grew more strongly than sales to rural customers while sales to direct industrial customers increased slightly. The chart (see page 26) provides the energy consumption by major customer category and an estimate of the energy consumed by market sector. The overall growth rate for 1985 was generally consistent with the average annual growth rate of 3.2 per cent over the last five years as shown in the Comparative Statistics.

The 1985 electricity rates for primary customers increased 8.6 per cent on average. The average increases for municipal utilities, rural retail and direct industrial customers were 8.5 per cent, 8.7 per cent and 8.8 per cent, respectively. The rural rate increase takes into account \$57 million in assistance provided by all electricity consumers in the province to reduce the electricity bills of year-round rural residential customers.

Secondary revenues for 1985, mainly from sales of electricity to American utilities, amounted to \$351 million. Compared with 1984, this represents a decrease of \$78 million or 18.2 per cent. This decrease reflects the competitive secondary sales market resulting from the current surplus of power and energy available in Canada and the United States.

Over the last five years, Ontario Hydro has earned approximately \$2,060 million in revenues from American utilities by selling electricity beyond the requirements of its customers in Ontario. The net benefit to Ontario customers was \$822 million for the period 1981 through 1985, and \$145 million in 1985. This benefit helped Ontario Hydro to keep electricity rates lower for Ontario customers.

Major Electricity Production Resources

Ontario Hydro responds instantly and efficiently to the energy demands of its customers by supplying electricity from a number of different sources. Hydraulic generating stations, which are relatively inexpensive to operate, have traditionally provided a major part of the electrical energy generated by Ontario Hydro. With most major accessible sites in the province already developed, hydraulic generation, as a percentage of total generation, has remained stable over the past few years. On the other hand, the Corporation



Primary Energy



Electricity Production



has increased its emphasis on nuclear generation. This emphasis is part of Ontario Hydro's acid gas emission reduction efforts. The other major source of generation of electricity is fossil generation. Due to the relatively high cost of fossil fuels, Hydro relies on its fossil-fuelled stations primarily to meet its needs for peaking power. The electricity production resources for the period 1981 through 1985 are shown in the chart below. The annual average costs per kilowatt-hour of energy by the major generating sources are shown in the Five-Year Summary of Financial Statistics.

Fuel and Fuel-related Costs

In 1985, fuel and related costs such as water rentals, power purchased, and the nuclear agreement-payback were 5.5 per cent lower than in 1984. Hydro's nuclear stations supplied 39 per cent of the total energy to the system in 1985. Hydraulic stations supplied 30 per cent and fossil-fuelled generation provided 24 per cent. Purchases of power from interconnected utilities provided the remaining 7 per cent. In 1984, electric energy from nuclear generation and fossil-fuelled generation supplied 33 per cent and 30 per cent, respectively, of the total energy to the system.

The 1985 fuel costs for coal and uranium amounted to \$968 million, a decrease of 6.6 per cent over 1984. The decrease is mainly due to the replacement of higher-cost coal by more economical uranium. This more than offsets the effect of the increased volume of electricity generated to meet increased demand. The increase in electricity provided from nuclear sources reflects the additional units placed in service in 1985, and also the full year's production from nuclear units placed in service in 1984.

The payments Ontario Hydro makes primarily to the Province of Ontario for the use of provincial waters in its hydraulic plants amounted to \$87 million in 1985, an increase of \$26 million over 1984. This increase reflects the impact of the tripling of these water rental rates in mid-1984.

Electricity purchased from neighbouring utilities amounted to \$163 million in 1985, an increase of \$14 million over 1984. These purchases are generally made during peak demand periods or emergency situations.

In 1985, units 1 and 2 of the Pickering Nuclear Generating Station were not operating, having been taken out of service in 1983 to replace existing pressure tubes. The maintenance and overhead costs during the shutdown have been included in the payback calculation in accordance with the Pickering Payback Agreement. As a result, Hydro was able to reduce its 1985 and 1984 operating costs by \$75 million and \$36 million respectively, which represents the amount to be offset against future amounts payable by Ontario Hydro to Atomic Energy of Canada Limited and the Province of Ontario, the other two parties to this agreement.

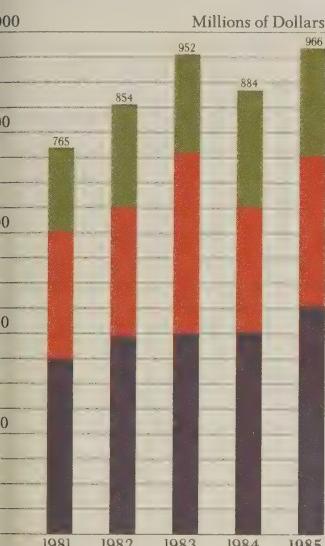
Operation, Maintenance and Administration

The costs associated with the operation, maintenance and administration of the Corporation in 1985 were \$966 million, an increase of \$82 million over 1984. This increase of 9.3 per cent is primarily related to placing new facilities in service, and cost increases due to inflation. The continued emphasis on cost control at all levels of the Corporation is having a positive financial impact on operation, maintenance and administration costs. The in-service capacity of the generation system grew about 6 per cent or 1,612 megawatts in 1985. The major component of this growth is the addition of two nuclear generating units and one fossil-fuelled generating unit. The transmission and distribution system work load also grew in 1985, as reflected in an increase of approximately 2 per cent in the number of customers and an increase of about 1 per cent in the kilometres of rural lines maintained. The transmission and distribution, and administration and support services components of operation, maintenance and administration costs declined slightly in 1985, while the generation component increased slightly. The chart (see next page) shows the operation, maintenance and administration costs by major activity for the period 1981 through 1985.

Operation, Maintenance and Administration

Transmission and Distribution
Administration and Support Services

Generation



Depreciation

The depreciation charged to operations totalled \$655 million in 1985, \$179 million or 37.6 per cent higher than in 1984. Contributing to that increase were the additional facilities placed in service, including Pickering unit 7, Bruce unit 5, the Atikokan Generating Station, and the full year's impact of Pickering unit 6 and Bruce unit 6 having been placed in service in 1984. In addition, the 1985 depreciation reflects an increase in the provision for the costs of removing pressure tubes in Pickering units 1 and 2. This increase resulted from advancing the timing of the retubing work.

Financing Charges

Financing charges are comprised of interest and foreign exchange costs. Interest charged to operations represents the total cost of borrowing less interest capitalized. This is designed to effect a proper allocation of costs between current and future customers. Foreign exchange mainly represents the amortization of unrealized gains or losses on the principal amount of foreign debt.

Gross interest costs for 1985 amounted to \$2,551 million, an increase of \$229 million or 9.9 per cent as compared with 1984. The primary reason for this increase is related to the additional funds borrowed during the year to finance the construction of new generating stations which are needed to meet future demand. In addition, gross interest payments also increased due to the effect of a weaker Canadian dollar relative to the American dollar on interest payments made in foreign currency.

Interest charged to operations amounted to \$1,325 million in 1985, \$376 million or 39.6 per cent higher than in 1984. The increase resulted primarily from placing additional nuclear generating units in service in 1985, and the full year's impact of units placed in service in 1984. The in-service date is the time from which interest is no longer capitalized and is charged to operations.

Foreign exchange costs amounted to \$176 million in 1985, an increase of \$58 million or 49.2 per cent over 1984. The major factor contributing to the increase in foreign exchange costs was the rise in the value of the American dollar relative to the Canadian dollar.

Net Income/Financial Soundness

Hydro earned a net income of \$360 million in 1985 compared with \$575 million in 1984. Net income has been invested in the Corporation and this has contributed to a gradual improvement in the trend of Ontario Hydro's debt ratio. The debt ratio at the end of 1985 was 83 per cent, the lowest level since the mid-1970s. The other main indicators of Ontario Hydro's financial soundness are the cash flow coverage and interest coverage ratios. The level of cash flow coverage for 1985 and 1984 were 1.02 times and 0.96 times, respectively. The level of interest coverage for 1985 and 1984 were 1.14 times and 1.25 times, respectively. The decrease in the interest coverage ratio has had no effect on the Corporation's ability to meet its interest payments and debt repayment obligations in 1985.

Capital Expenditures and Financing

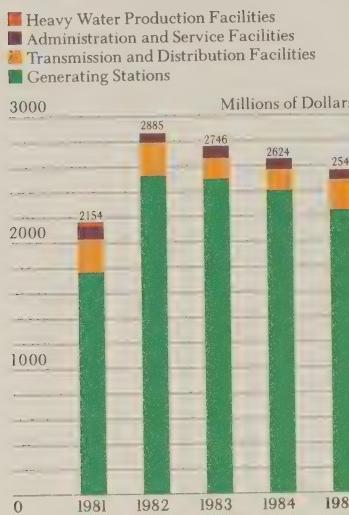
Investment in Fixed Assets

Ontario Hydro invests in fixed assets to meet expected growth in the demand for electricity, to replace existing assets with facilities that are more economical, and to meet regulatory requirements. The total assets of the Corporation at the end of 1985 were \$29,320 million and of this amount, about 82 per cent consists of fixed assets in service and under construction. This relatively high percentage reflects the capital-intensive nature of Ontario Hydro's business.

The investment in fixed assets during 1985 was \$2,541 million. A major portion of the 1985 capital expenditures went toward the construction of new



Investment in Fixed Assets During the Year



generating facilities. Compared with 1984, there was a shift in the mix of the 1985 capital expenditures, reflecting the continued emphasis being placed on expenditures for transmission and distribution facilities. The expenditures on major capital projects under construction during 1985 and 1984 were:

	1985	1984
	millions of dollars	
Nuclear Generation		
Pickering	137	260
Bruce	417	680
Darlington	999	855
Fossil Generation		
Atikokan	109	109
Generating Facilities	1,662	1,910
Transmission & Distribution	249	163

Hydro placed in service unit 7 at Pickering and unit 5 at Bruce in January and March, 1985, respectively. The total cost was \$2,368 million, including \$461 million for heavy water. In addition, in November 1985, the fossil unit at the Atikokan Generating Station was placed in service at a cost of \$748 million.

There has been a steady decline in the annual investment in fixed assets from \$2,885 million in 1982 to \$2,541 million in 1985, as the major generating projects are completed. The expenditures for investment in fixed assets for the period 1981 through 1985 are shown in the chart.

Financing

Cash required by Ontario Hydro to finance the investment in fixed assets is provided from two major sources: cash provided from operations and cash from external borrowings. For 1985, cash provided from operations, and cash from financing were 41.5 per cent and 29.8 per cent respectively, of the investment in fixed assets. Cash from borrowings represents the amount of cash provided from long-term debt less retirements. The balance of cash required for the investment in fixed assets was provided primarily as a result of a reduction in the level of corporate liquidity.

The 1985 proceeds from long-term debt, net of retirements, of \$757 million were approximately 43 per cent of the 1984 level and the lowest since the mid-1970s. The proceeds from the issue of bonds by Ontario Hydro during 1985 amounted to \$1,737 million. These proceeds were from eight Canadian issues with an average coupon interest rate of 10.8 per cent for an average term of nine years. For the same period in 1984, the average coupon interest rate and the average term of new debt issued were 12.5 per cent and 9.1 years respectively. In addition, proceeds of \$44 million were received from the issues of long-term notes.

Cash provided from financing from 1981 through 1985 is shown in the chart. The principal markets Ontario Hydro has operated in are the Canadian, United States, and Eurodollar public markets. The borrowing requirements for 1985, except for \$29 million, were met entirely from the Canadian public market to minimize foreign exchange exposure.

Cash amounting to \$849 million was used to retire maturing long-term debt in 1985, compared with \$266 million in 1984. In addition, during 1985, cash amounting to \$175 million was used to redeem debt prior to maturity, compared with \$131 million in 1984.

Summary

Ontario Hydro's 1985 financial results reflected a 3.1 per cent growth in the volume of primary energy sales which was consistent with the average annual growth rate over the last five years. Cost control programs and productivity improvements continue to be effective.

The financial position of the Corporation has remained strong. Ontario Hydro was able to reduce the amount of net borrowings required in 1985 to less than half of the 1984 level. As a result, Ontario Hydro's debt ratio is now at the lowest level since the mid-1970s.

Ontario Hydro

Summary of Significant Accounting Policies

The accompanying financial statements have been prepared by management in accordance with accounting principles generally accepted in Canada, applied on a basis consistent with that of the preceding year. In management's opinion, the financial statements have been properly prepared within reasonable limits of materiality and in the light of information available up to March 10, 1986.

Rate setting

Ontario Hydro has broad powers to generate, supply and deliver electric power throughout the Province of Ontario. The Corporation operates under the Power Corporation Act and is subject to provisions of the Ontario Energy Board Act.

Under the provisions of the Power Corporation Act, the price payable by customers for power is the cost of supplying the power. Such cost is defined in the Act to include the cost of operating and maintaining the system, depreciation, interest, and the amounts appropriated for debt retirement and stabilization of rates and contingencies. The debt retirement appropriation is the amount required under the Act to accumulate on a sinking fund basis over 40 years a sum equal to the debt incurred for the cost of the fixed assets in service. The appropriation for, or withdrawal from, the stabilization of rates and contingencies reserve is an amount established to maintain a sound financial position and to stabilize the effect of cost fluctuations.

Under the provisions of the Ontario Energy Board Act, a public hearing before the Ontario Energy Board is required in respect of any changes in electricity rates proposed by Ontario Hydro which affect its municipal utilities, direct industrial customers, or, if the Minister of Energy so directs, rural retail customers. The Ontario Energy Board submits its recommendations to the Minister of Energy. After considering the recommendations of the Ontario Energy Board, the Board of Directors of Ontario Hydro, under the authority of the Power Corporation Act, establishes the electricity rates to be charged to customers.

If the Board of Directors specifies a certain cost or gain is to be included in future electricity rates that, in accordance with the accounting policies summarized below, would be charged or credited to operations in the current year, then this cost or gain is deferred and amortized to future operations on a basis consistent with its inclusion in rates.

Fixed assets

Fixed assets in service include operating facilities and non-operating reserve facilities. Construction in progress includes fixed assets under construction and heavy water held for use in nuclear generating stations under construction.

Fixed assets are capitalized at cost which comprises material, labour, engineering costs, and the costs of training initial operating staff for new facilities as well as overheads, depreciation on service equipment, and interest applicable to capital construction activities. In the case of generation facilities, the cost also includes the net cost of commissioning, and for nuclear generation, the cost of heavy water. The net cost of commissioning is the cost of start-up less the value attributed to energy produced by generation facilities during their commissioning period. The cost of heavy water comprises the direct cost of production and applicable overheads, as well as interest and depreciation on the heavy water production facilities. For multi-unit facilities, a proportionate share of the cost of common facilities is placed in service with each major operating unit. Leases which transfer the benefits and risks of ownership of assets to Ontario Hydro are capitalized.

Interest is capitalized on construction in progress at rates (1985—13.9 per cent, 1984—13.8 per cent) which approximate the average cost of long-term funds borrowed in the years in which expenditures have been made for fixed assets under construction. If the construction period of a project is extended and the construction activities are continued, interest is capitalized during the period of extension provided that the project has a reasonable expectation of being completed.

If a project is cancelled or deferred indefinitely with a low probability of construction being resumed, all costs including the costs of cancellation are written off to operations.

If fixed assets are removed from operations and mothballed for future use, termed non-operating reserve facilities, the costs of mothballing are charged to operations.

Depreciation

The capital costs of fixed assets in service are depreciated on a straight-line basis. Depreciation rates for the various classes of assets are based on their estimated service lives. Major components of generating stations are depreciated over the lesser of the service life expectancy of the component or the remaining service life of the associated generating station.

The estimated service lives of assets for 1985 and 1984 in the major classes are:

Generating stations—hydraulic	—65 to 100 years
—fossil	—25 to 35 years
—nuclear	—40 years
Heavy water	—over the period ending in the year 2040
Transmission and distribution	—20 to 55 years
Administration and service	—5 to 60 years
Heavy water production facilities	—20 years

In accordance with group depreciation practices, for normal retirements the cost of fixed assets retired is charged to accumulated depreciation with no gain or loss being reflected in operations. However, gains and losses on sales of fixed assets, and losses on premature retirements are charged to operations in the year incurred as adjustments to depreciation expense.

When the costs of removal less residual value, termed removal costs, on retirements of fixed assets can be reasonably estimated and are significant, provisions for these costs are charged to depreciation expense on an annuity basis over the remaining service life of the related fixed assets. Other removal costs are charged to depreciation expense as incurred. Removal costs include the estimated costs of decommissioning nuclear stations and the estimated costs of removing certain nuclear reactor fuel channels.

Changes in the estimated service lives of fixed assets and in the significant assumptions underlying the estimates of fixed asset removal costs are subject to periodic review. Such changes are implemented on a remaining service life basis from the year the changes can be first reflected in electricity rates.

Non-operating reserve facilities are amortized so that any estimated loss in value is charged to depreciation expense on a straight-line basis over their expected non-operating period.

Unamortized advances for fuel supplies

As part of its program to ensure the adequate supply of fuels for its generating stations, Ontario Hydro has entered into long-term fuel supply contracts. Where these contracts require Ontario Hydro to make payments for pre-production costs to suppliers in advance of the fuel delivery, these payments and associated costs, including interest, are carried in the accounts as unamortized advances for fuel supplies. The advances are amortized to fuel inventory as the fuels are delivered.

Fuel for electric generation

Fuel used for electric generation comprises the average inventory costs of fuel consumed, charges for commissioning energy produced, and provisions for disposal of nuclear fuel irradiated during the period. The inventory cost of fuel consumed comprises fuel purchases, transportation and handling costs, and the amortization of advances for fuel supplies. Transportation costs include charges for interest and depreciation on railway equipment owned by Ontario Hydro.

The charges for commissioning energy produced during the period represent the incremental operating and fuel costs of producing the same quantity of energy at generating units displaced because of the commissioning activity. The costs for disposal of nuclear fuel irradiated in each period are charged to operations based on estimated future expenditures and interest accumulating to the estimated date of disposal. Estimates of expenditures, interest and escalation rates, and the date of disposal are subject to periodic review. Adjustments resulting from changes in estimates are charged to operations on an annuity basis over the period from the year the changes can be first reflected in electricity rates to the estimated in-service date of the disposal facility.

Foreign currency translation

Current monetary assets and liabilities are translated to Canadian currency at year-end rates of exchange and the resulting gains or losses are credited or charged to operations. Long-term debt payable in foreign currencies is translated to Canadian currency at year-end rates of exchange. Resulting unrealized exchange gains or losses are deferred and included in unamortized debt costs, and are amortized to operations on an annuity basis over the remaining life of related debt. Foreign exchange gains or losses on early redemption of long-term debt are deferred and included in unamortized debt costs, and are amortized to operations on an annuity basis over the average life of debt denominated in the same currency issued during the previous year.

Unamortized debt costs

Unamortized debt costs include the unamortized amounts related to unrealized foreign exchange gains or losses resulting from the translation of foreign currency long-term debt, foreign exchange gains or losses on the early redemption of long-term debt, and discounts or premiums arising from the issuance of debt or the acquisition of debt prior to maturity.

Debt discounts or premiums arising on the issuance of debt are amortized over the period to maturity of the debt. Discounts or premiums on debt acquired prior to the date of maturity are amortized over the period from the acquisition date to the original maturity date of the debt.

Nuclear agreement – Pickering units 1 and 2

Ontario Hydro, Atomic Energy of Canada Limited and the Province of Ontario are parties to a joint undertaking for the construction and operation of units 1 and 2 of Pickering Nuclear Generating Station, with ownership of these units being vested in Ontario Hydro. Contributions to the capital cost by Atomic Energy of Canada Limited and the Province of Ontario amounted to \$258 million and these have been deducted in arriving at the value of fixed assets in service in respect of Pickering units 1 and 2. Ontario Hydro is required to make monthly payments until the year 2001 to each of the parties in proportion to their capital contributions. These payments, termed "payback", represent in a broad sense the net operational advantage of having the power generated by Pickering units 1 and 2 as compared with coal-fired units similar to Lambton units 1 and 2.

Pension plan

The pension plan is a contributory, defined benefit plan covering all regular employees of Ontario Hydro. Ontario Hydro is responsible for all deficiencies and surpluses in the pension plan. Pension costs, as actuarially determined, consist of current service costs and amounts required to amortize any surpluses or unfunded liabilities. A net unfunded liability arising from past service obligations is amortized up to fifteen years. All other net unfunded liabilities or net surpluses in the fund are amortized up to five years.

Research and development

Research and development costs are charged to operations in the year incurred, except for those related directly to the design or construction of a specific capital facility which are capitalized as part of the facility.



Auditors' Report

To the Board of Directors
of Ontario Hydro:

We have examined the statement of financial position of Ontario Hydro as at December 31, 1985 and the statements of operations, equities accumulated through debt retirement appropriations, reserve for stabilization of rates and contingencies and source of cash used for investment in fixed assets for the year then ended. Our examination was made in accordance with generally accepted auditing standards, and accordingly included such tests and other procedures as we considered necessary in the circumstances.

In our opinion, these financial statements present fairly the financial position of Ontario Hydro as at December 31, 1985 and the results of its operations and the source of cash used for investment in fixed assets for the year then ended in accordance with generally accepted accounting principles applied on a basis consistent with that of the preceding year.

Toronto, Canada,
March 10, 1986.

CLARKSON GORDON
Chartered Accountants

Ontario Hydro
Statement of Operations
 for the year ended December 31, 1985

	1985	1984
millions of dollars		
Revenues		
Primary power and energy		
Municipal utilities	2,891	2,555
Rural retail customers	815	712
Direct industrial customers	568	516
	4,274	3,783
Secondary power and energy (note 1)	351	429
	4,625	4,212
Costs		
Operation, maintenance and administration	966	884
Fuel used for electric generation	968	1,036
Water rentals (note 2)	87	61
Power purchased	163	149
Nuclear agreement—payback (note 3)	(75)	(36)
Depreciation (note 4)	655	476
	2,764	2,570
Income before financing charges	1,861	1,642
Interest (note 5)	1,325	949
Foreign exchange (note 6)	176	118
	1,501	1,067
Net income	360	575
Appropriation for:		
Debt retirement	252	210
Stabilization of rates and contingencies	108	365
	360	575

See accompanying summary of significant accounting policies and notes to financial statements.

Ontario Hydro
Statement of Financial Position

at December 31, 1985

	1985	1984
millions of dollars		
Assets		
Fixed assets (note 7)		
Fixed assets in service	20,604	17,215
Less accumulated depreciation	4,614	4,069
	<hr/>	<hr/>
Construction in progress	15,990	13,146
	<hr/>	<hr/>
	8,159	9,001
	<hr/>	<hr/>
	24,149	22,147
<hr/>		
Current assets		
Cash and short-term investments	18	658
Accounts receivable	550	442
Fuel for electric generation (note 8)	1,015	973
Materials and supplies, at cost	215	179
	<hr/>	<hr/>
	1,798	2,252
<hr/>		
Other assets		
Unamortized debt costs	1,897	1,447
Unamortized advances for fuel supplies (note 9)	899	883
Unamortized deferred costs (note 10)	313	358
Long-term accounts receivable and other assets	264	214
	<hr/>	<hr/>
	3,373	2,920
	<hr/>	<hr/>
	29,320	27,301

See accompanying summary of significant accounting policies and notes to financial statements.

Liabilities

	1985	1984
	millions of dollars	
Long-term debt (note 11)	22,518	20,659
Current liabilities		
Accounts payable and accrued charges	549	616
Short-term notes payable	223	49
Accrued interest	710	672
Long-term debt payable within one year	407	847
	1,889	2,184
Other liabilities		
Long-term accounts payable and accrued charges	158	152
Accrued irradiated fuel disposal and fixed asset removal costs (note 12)	311	222
	469	374
Contingencies (notes 3, 9 and 13)		
Equity		
Equities accumulated through debt retirement appropriations	2,618	2,366
Reserve for stabilization of rates and contingencies	1,699	1,591
Contributions from the Province of Ontario as assistance for rural construction	127	127
	4,444	4,084
	29,320	27,301

On behalf of the Board

Chairman

President

Toronto, Canada,
March 10, 1986.

Ontario Hydro
Statement of Equities Accumulated Through
Debt Retirement Appropriations
 for the year ended December 31, 1985

	Municipal Utilities	Power District (Rural Retail and Direct Industrial Customers)	Totals
			1985 1984
millions of dollars			
Balances at beginning of year	1,653	713	2,366 2,156
Appropriation	172	80	252 210
Transfers and refunds on annexations by municipal utilities	2	(2)	-
Balances at end of year	1,827	791	2,618 2,366

**Statement of Reserve for Stabilization
of Rates and Contingencies**

for the year ended December 31, 1985

	Held for the benefit of all customers	Held for the benefit of (or recoverable from) certain groups of customers			Totals	
	Municipal Utilities	Rural Customers	Industrial Customers	1985	1984	
millions of dollars						
Balances at beginning of year	1,614	1	(23)	(1)	1,591	1,221
Appropriation	128	-	(16)	(4)	108	36
Balances at end of year	1,742	1	(39)	(5)	1,699	1,591

See accompanying summary of significant accounting policies and notes to financial statements.

Ontario Hydro
Statement of Source of Cash
Used for Investment in Fixed Assets
 for the year ended December 31, 1985

	1985	1984
millions of dollars		
Operating activities		
Cash provided from operations (note 14)	1,055	1,088
Financing activities		
Long-term debt issued	1,781	2,153
Less retirements	1,024	397
Cash provided from financing	757	1,756
Investing activities in other assets – decrease (increase) (note 14)	18	(28)
Cash from operating, financing and other investing activities	1,830	2,816
Changes in cash and cash equivalents – decrease (increase)	814	(277)
Cash used for investment in fixed assets	2,644	2,539
Changes in accounts payable and accrued charges affecting investment in fixed assets –(decrease) increase	(103)	85
Investment in fixed assets	2,541	2,624

See accompanying summary of significant accounting policies and notes to financial statements.

Ontario Hydro
Notes to Financial Statements

1. Secondary power and energy	Secondary power and energy revenues include \$350 million (1984—\$427 million) from sales of electricity to United States utilities.																																										
2. Water rentals	Water rentals are the amounts paid primarily to the Province of Ontario for the use of water for hydraulic generation.																																										
3. Nuclear agreement—payback	<p>During 1983, units 1 and 2 of the Pickering Nuclear Generating Station were shut down for replacement of pressure tubes and did not operate for a period of time in 1983, and during 1984 and 1985. The Nuclear Agreement, which is described in the Summary of Significant Accounting Policies, allows maintenance and overhead costs during the shutdown period to be included in payback calculations. The calculations have resulted in negative payback amounts of \$8 million in 1983, \$36 million in 1984 and \$75 million in 1985. These amounts totalling \$119 million, have been credited against the costs of operations for the respective years and are included in "long-term accounts receivable and other assets". The basis for this accounting treatment is the belief by Ontario Hydro that under the Nuclear Agreement, these amounts, termed "negative payback", plus interest, can be offset against future positive payback amounts payable to the Province of Ontario and to Atomic Energy of Canada Limited when the units return to service. Atomic Energy of Canada Limited has objected to this interpretation and takes the position that "negative payback" is not to be offset against future positive payback amounts. The interpretation of the Nuclear Agreement and the manner of recovering costs associated with the rehabilitation of units 1 and 2 are being discussed among the parties to the Nuclear Agreement.</p> <p>In accordance with an agreement dated March 14, 1983, between Atomic Energy of Canada Limited and Ontario Hydro, provisions for irradiated fuel disposal costs related to Pickering Nuclear Generating Station units 1 and 2 have been included, subject to further discussions, in the calculation of payback for the years 1982, 1983 and 1984. The parties to the Nuclear Agreement are discussing whether these provisions are properly allowable costs for the period 1982 to 1984, and also whether such costs should continue to be included in the calculation of payback subsequent to 1984. Atomic Energy of Canada Limited and the Province of Ontario's share of irradiated fuel disposal costs included in the calculation of payback for the years 1982, 1983 and 1984 totalled \$16 million at December 31, 1984. The provisions for 1985 are not significant as the Pickering units 1 and 2 did not operate during the year.</p>																																										
4. Depreciation	<table style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th></th> <th style="text-align: right; vertical-align: bottom;">1985</th> <th style="text-align: right; vertical-align: bottom;">1984</th> </tr> </thead> <tbody> <tr> <td></td><td style="text-align: right; vertical-align: bottom;">millions of dollars</td><td style="text-align: right; vertical-align: bottom;">5</td> </tr> <tr> <td>Depreciation of fixed assets in service</td><td style="text-align: right; vertical-align: bottom;">594</td><td style="text-align: right; vertical-align: bottom;">5</td> </tr> <tr> <td>Amortization of deferred costs</td><td style="text-align: right; vertical-align: bottom;">39</td><td style="text-align: right; vertical-align: bottom;">4</td> </tr> <tr> <td>Provision for net removal costs</td><td style="text-align: right; vertical-align: bottom;">104</td><td style="text-align: right; vertical-align: bottom;">3</td> </tr> <tr> <td>Other removal costs</td><td style="text-align: right; vertical-align: bottom;">10</td><td style="text-align: right; vertical-align: bottom;">1</td> </tr> <tr> <td></td><td style="text-align: right; vertical-align: bottom;">747</td><td style="text-align: right; vertical-align: bottom;">5</td> </tr> <tr> <td>Less:</td><td></td><td></td> </tr> <tr> <td>Depreciation charged to—heavy water production</td><td style="text-align: right; vertical-align: bottom;">50</td><td style="text-align: right; vertical-align: bottom;">8</td> </tr> <tr> <td> —construction in progress</td><td style="text-align: right; vertical-align: bottom;">27</td><td style="text-align: right; vertical-align: bottom;">2</td> </tr> <tr> <td> —fuel for electric generation</td><td style="text-align: right; vertical-align: bottom;">2</td><td style="text-align: right; vertical-align: bottom;">1</td> </tr> <tr> <td>Net gain on sales of fixed assets</td><td style="text-align: right; vertical-align: bottom;">13</td><td style="text-align: right; vertical-align: bottom;">4</td> </tr> <tr> <td></td><td style="text-align: right; vertical-align: bottom;">92</td><td style="text-align: right; vertical-align: bottom;">4</td> </tr> <tr> <td></td><td style="text-align: right; vertical-align: bottom;">655</td><td style="text-align: right; vertical-align: bottom;">4</td> </tr> </tbody> </table>		1985	1984		millions of dollars	5	Depreciation of fixed assets in service	594	5	Amortization of deferred costs	39	4	Provision for net removal costs	104	3	Other removal costs	10	1		747	5	Less:			Depreciation charged to—heavy water production	50	8	—construction in progress	27	2	—fuel for electric generation	2	1	Net gain on sales of fixed assets	13	4		92	4		655	4
	1985	1984																																									
	millions of dollars	5																																									
Depreciation of fixed assets in service	594	5																																									
Amortization of deferred costs	39	4																																									
Provision for net removal costs	104	3																																									
Other removal costs	10	1																																									
	747	5																																									
Less:																																											
Depreciation charged to—heavy water production	50	8																																									
—construction in progress	27	2																																									
—fuel for electric generation	2	1																																									
Net gain on sales of fixed assets	13	4																																									
	92	4																																									
	655	4																																									

Interest	1985	1984	
	millions of dollars		
Interest on bonds, notes, and other debt	2,523	2,298	
Interest on accrued irradiated fuel disposal and fixed asset removal costs	28	24	
	<u>2,551</u>	2,322	
Less:			
Interest charged to—construction in progress	933	1,063	
—heavy water production	116	117	
—fuel for electric generation	102	97	
—unamortized advances for fuel supplies	15	16	
Interest earned on investments	60	80	
	<u>1,226</u>	1,373	
	<u>1,325</u>	949	
Foreign exchange	1985	1984	
	millions of dollars		
Amortization of foreign exchange gains and losses	190	120	
Net exchange gain on other foreign transactions	(14)	(2)	
	<u>176</u>	118	
Fixed assets	1985		
	Assets in Service	Accumulated Depreciation	Construction in Progress
	millions of dollars		
Generating stations—hydraulic	1,830	544	11
—fossil	2,836	697	32
—nuclear	6,805	718	6,561
Heavy water	1,605	136	1,187
Transmission and distribution	4,462	1,182	304
Administration and service	915	383	64
Heavy water production facilities	1,128	285	—
Non-operating reserve facilities			
—fossil generating stations	786	432	—
—heavy water production facilities	237	237	—
	20,604	4,614	8,159



**7. Fixed assets
(Continued)**

	1984		
	Assets in Service	Accumulated Depreciation	Construction in Progress
millions of dollars			
Generating stations—hydraulic	1,818	514	13
—fossil	2,041	629	655
—nuclear	4,898	542	6,747
Heavy water	1,149	112	1,308
Transmission and distribution	4,310	1,088	241
Administration and service	845	341	37
Heavy water production facilities	1,123	232	—
Non-operating reserve facilities			
—fossil generating stations	794	374	—
—heavy water production facilities	237	237	—
	17,215	4,069	9,001

Non-operating reserve facilities consist of Lennox, R.L. Hearn, J.C. Keith and Thunder Bay unit 1 fossil generating stations, and Bruce Heavy Water Plant "A". Substantially all of the undepreciated cost of non-operating reserve facilities is related to Lennox generating station, which based on current forecasts, is expected to return to operations in the late 1990s.

Construction in progress at December 31, 1985:

	Remaining Number of Units Scheduled	Planned In-Service Dates	Dependable Capacity to be Placed in Service	Costs Incurred to December 31, 1985	Estimated Costs to Complete (Excluding Escalation and Interest)
megawatts millions of dollars					
Nuclear generating stations (including heavy water)					
Pickering "B"	1	1986	516	924	5
Bruce "B"	2	1986-87	1,590	2,730	13
Darlington	4	1988-92	3,524	3,746	3,16
All other construction in progress	—	—	—	759	
				8,159	

Estimated costs to complete are the most recent projections. These estimates exclude cost escalation and interest which are forecast to average 7% and 12% per year, respectively, over the period 1986 to 1992. Because of the uncertainties associated with long construction lead times and planned in-service dates, these costs to complete are subject to change.

The fuel channel replacement program for Pickering "A" units 1 and 2 is estimated to cost \$415 million, excluding interest and escalation. Of this total, \$262 million is to be capitalized as installation costs, and the remaining \$153 million is related to the removal costs of the existing pressure tubes and is being recovered through charges to operations as described in note 12. The actual expenditures for installation costs, including interest of \$30 million, totalled \$160 million as of December 31, 1985 and are included in all other construction in progress in the above table. The first two units of Pickering "A" are expected to be returned to service in 1987.

For 1986, additional investment in fixed assets is estimated to be approximately \$2,465 million including escalation and interest.

Fuel for electric generation	1985	1984
	millions of dollars	
Inventories—uranium	533	427
—coal	482	546
	<u>1,015</u>	<u>973</u>

Unamortized advances for fuel supplies	1985	1984
	millions of dollars	
Uranium—Rio Algom Limited	450	447
—Denison Mines Limited	355	354
	<u>805</u>	<u>801</u>
Coal	94	82
	<u>899</u>	<u>883</u>

Unamortized advances for fuel supplies are recovered as fuel is delivered. Contractual obligations for additional advance payments for uranium supplies together with interest capitalization approximately equal the amortization of advances for uranium supplies over the next five years.

Ontario Hydro has entered into long-term contracts with Denison Mines Limited and Rio Algom Limited for uranium supplies through to 2012 and 2024, respectively. Ontario Hydro's current forecast of the annual requirements for uranium is approximately 1,200 megagrams for 1986, increasing to approximately 1,800 megagrams by 1994. The forecasted requirements and contracted deliveries are in balance up to 1994. Commencing in 1994 through to 2012, contracted deliveries exceed requirements of the nuclear generating facilities currently in service and under construction by approximately 900 megagrams per year. Ontario Hydro's options for managing the oversupply include resale of the uranium and, under specified conditions, cancellation or renegotiation of the contracts. In the event that a contract is cancelled, the supplier is not required to refund any outstanding advances. At this time, the likelihood of a contract cancellation and the financial implications of pursuing the options are not determinable.

Unamortized deferred costs	1985	1984
	millions of dollars	
Bruce Heavy Water Plant "D"	280	317
Wesleyville Generating Station	33	41
	<u>313</u>	<u>358</u>

Bruce Heavy Water Plant "D" is an indefinitely deferred project with a low probability of construction being resumed. The capital cost of this project and the unamortized deferred costs associated with the cancelled Wesleyville generating station project were not written off directly to operations since the Board of Directors under its rate setting authority decided that these costs be amortized for recovery through electricity rates over the period 1984 through 1993, which results in an annual charge of \$39 million for 1985.



11. Long-term debt

	1985	1984
	millions of dollars	
Bonds and notes payable	22,728	21,293
Other long-term debt	197	213
	22,925	21,506
Less payable within one year	407	847
	22,518	20,659

Bonds and notes payable:

Bonds and notes payable, expressed in Canadian dollars, are summarized by years of maturity and by the currency in which they are payable in the following table:

Years of Maturity	1985			1984		
	Principal Outstanding			Weighted Average Coupon Rate	Principal Outstanding	
	Canadian	Foreign	Total		Total	Weighted Average Coupon Rate
				per cent	millions of dollars	per cent
1985	—	—	—		827	—
1986	150	236	386		351	—
1987	732	307	1,039		991	—
1988	852	339	1,191		1,158	—
1989	519	828	1,347		1,323	—
1990	953	803	1,756		—	—
1-5 years	3,206	2,513	5,719	11.5	4,650	11.5
6-10 years	2,207	2,819	5,026	12.8	4,882	12.3
11-15 years	1,687	786	2,473	9.5	1,807	8.0
16-20 years	2,676	1,420	4,096	11.2	4,010	11.0
21-25 years	1,740	2,265	4,005	10.5	4,168	9.9
26-30 years	323	1,086	1,409	14.8	1,776	14.3
	11,839	10,889	22,728	11.5	21,293	11.5
Currency in which payable:						
Canadian dollars			11,839		10,658	
United States dollars			10,699		10,498	
Swiss francs			122		92	
West German Deutsche marks			41		45	
United Kingdom pounds sterling			27		—	
			22,728		21,293	

Bonds and notes payable in United States dollars include Canadian \$7,190 million (1984 – Canadian \$6,966 million) of Ontario Hydro bonds held by the Province of Ontario and having terms identical with Province of Ontario issues sold in the United States on behalf of Ontario Hydro. Bonds and notes payable are either held, or guaranteed as to principal and interest, by the Province of Ontario.

**Long-term debt
(Continued)**

Other long-term debt:

	Years of Maturity	Interest Rate	1985	1984
		per cent	millions of dollars	
Balance due to Atomic Energy of Canada Limited on purchase of Bruce Heavy Water Plant "A"	1992	7.8	137	150
Capitalized lease obligation for the Head Office building, payable in U.S. dollars	2005	8.0	53	51
Capitalized lease obligations for transport and service equipment	1986 to 1988	6.8 to 11.0	7	12
			197	213

Payments required on the above debt, excluding interest, will total \$103 million over the next five years. The amount payable within one year is \$21 million (1984 – \$20 million).

Accrued irradiated fuel disposal and fixed asset removal costs

	1985	1984
	millions of dollars	
Accrued irradiated fuel disposal costs	189	147
Accrued fixed asset removal costs	122	75
	311	222

Irradiated fuel disposal costs:

The significant assumptions used in estimating the future irradiated fuel disposal costs were:

- an in-service date of the year 2010 for irradiated nuclear fuel disposal facilities;
- a transportation distance of 1,000 kilometres from nuclear generating facilities to disposal facilities;
- interest rates through to the disposal date ranging from 10% to 15% (1984 – 10% to 16%); and
- escalation rates through to the disposal date ranging from 5% to 12% (1984 – 6% to 12%).

Because of the uncertainties associated with the technology of disposal, and the above factors, these costs are subject to change.

Fixed asset removal costs:

Fixed asset removal costs are the costs of decommissioning nuclear generating stations after the end of their service lives, and the costs of removing certain fuel channels from nuclear reactors which are expected to be replaced during the life of the reactors.

The significant assumptions used in estimating decommissioning costs were:

- decommissioning on the deferred dismantlement basis (dismantlement following storage with surveillance for a 30-year period after shutdown of the reactors);
- a transportation distance of 1,000 kilometres from nuclear generating facilities to disposal facilities;
- interest rates through to 2061 ranging from 10% to 15% (1984 – 10% to 16%); and
- escalation rates through to 2061 ranging from 5% to 12% (1984 – 6% to 12%).

The significant assumptions used in estimating the fuel channel removal costs were:

- removal of fuel channels in Pickering Nuclear Generating Station "A" units 1 and 2 in the 1984 to 1987 period, and units 3 and 4 in the 2000 to 2003 period,

**12. Accrued irradiated fuel disposal
and fixed asset removal costs
(Continued)**

and Bruce Nuclear Generating Station "A" units 1 to 3 in the 2002 to 2007 (1984 – 1998 to 2006) period;

- interest rates through to 2007 (1984 – to 2006) ranging from 10% to 13% (1984 – 10% to 16%); and
- escalation rates through to 2007 (1984 – to 2006) ranging from 6% to 9% (1984 – 6% to 11%).

Because of the uncertainties associated with the technology of decommissioning and fuel channel removal, and the above factors, these costs are subject to change.

The fuel channel removal costs incurred to date of \$89 million related to Pickering "A" units 1 and 2 exceed the amounts provided as of December 31, 1985 by \$11 million. The amount of \$11 million is included with "Long-term accounts receivable and other assets" and will be recovered by way of annual provision through to 1987 when both units are expected to return to service.

13. Fuel oil contract

Ontario Hydro contracted with Petrosar Limited for the purchase of 20,000 barrels of residual fuel oil per day through to April, 1992. Deliveries for the years 1981 and 1982 were 6% and 2%, respectively, of the contract quantities. No deliveries were taken during 1983, 1984 and 1985. Amounts have been charged to the costs of operations in prior years to provide for settlement with respect to reduced deliveries up to and including 1982. Ontario Hydro advised Petrosar Limited on May 24, 1983 that the contract is at an end due to Petrosar Limited prior undertaking to the Government of Canada to limit its production of residual fuel oil to an amount less than the contracted quantities. Petrosar Limited has commenced actions claiming damages of \$45.5 million and \$59.9 million for failure to take the contract quantities in 1981 and 1982 respectively. Ontario Hydro has counterclaimed for \$39.4 million paid to Petrosar Limited in 1980, 1981 and 1982 and an accounting for the difference between market and contract prices for residual fuel oil supplied since the date of such undertaking. The trial on this matter in the Supreme Court of Ontario commenced on November 25, 1985 and is expected to be completed in the latter part of March, 1986. At this time, the decision of the court and any financial implications for Ontario Hydro are not determinable.

**14. Statement of Source of Cash Used
for Investment in Fixed Assets**

The Statement of Source of Cash Used for Investment in Fixed Assets reports changes in cash and cash equivalents, defined to be cash and short-term investments net of short-term notes payable, rather than working capital, which was the practice in prior years. The 1984 amounts have been reclassified to conform with the 1985 financial statement presentation.

Cash provided from operations is derived as follows:

	1985	1984
	millions of dollars	
Net Income	360	5
Items not requiring cash in the current year		
Depreciation	655	4
Amortization of foreign exchange gains and losses	190	1
Provision for irradiated fuel disposal costs	24	
Nuclear agreement – payback	(75)	
Other	21	
Funds provided from operations	1,175	1,1
Changes in working capital, excluding cash and cash equivalents, and long-term accounts payable affecting operations – (increase)	(120)	(10)
Cash provided from operations	1,055	1,0

**Statement of Source of Cash Used
for Investment in Fixed Assets**
(Continued)

Investment in other assets is derived as follows:

	1985	1984
	millions of dollars	
Advances and related costs for fuel supplies	(37)	(46)
Less repayments and amortization of advances for fuel supplies	39	57
	<hr/>	<hr/>
Other	2	11
	<hr/>	<hr/>
Investment in other assets – decrease (increase)	16	(39)
	<hr/>	<hr/>
	18	(28)

Pension and insurance plans

Ontario Hydro's employee benefit programs include pension and insurance plans. The assets of the pension, group life insurance and long-term disability plans and the changes in assets during the year are shown in the financial statements of The Pension and Insurance Fund, and are not included in Ontario Hydro's financial statements.

The most recent actuarial valuation of Ontario Hydro's pension plan as at December 31, 1984 reported a surplus of approximately \$220 million (December 31, 1983 – \$115 million). The increase in the pension plan surplus during 1984 is attributable to an experience surplus of \$133 million, partially offset by the amortization of \$28 million of the established surplus. On January 1, 1985, \$42 million of the \$220 million surplus was applied towards plan improvements to the pension plan.

The significant actuarial assumptions used in the 1984 and 1983 valuations were:

- rate used to discount future investment income – 8.5%, and future benefits – 8%;
- salary escalation rate – 8%;
- average retirement age for males – 60.3 (1983 – 61.2) and for females – 61.2 (1983 – 60.7); and
- corporate shares valuation – five-year average.

The pension plan costs for 1985 were \$21 million (1984 – \$51 million) after the deduction of \$58 million (1984 – \$28 million) for the amortization of pension plan surplus.

The group life insurance plan had a surplus of approximately \$34 million as of December 31, 1985 (December 31, 1984 – \$33 million). This surplus, subject to approval by an order-in-council from the Province of Ontario, will be used to pay the insurance premiums for all employees who are members of the plan.

Research and development

In 1985, approximately \$63 million of research and development costs were charged to operations and \$17 million were capitalized (1984 – \$55 million and \$17 million, respectively).

Ontario Hydro
Five-Year Summary of
Financial Statistics

	1985	1984	1983	1982	1981
millions of dollars					
Revenues					
Primary power and energy					
Municipal utilities	2,891	2,555	2,265	1,997	1,800
Rural retail customers	815	712	644	576	546
Direct industrial customers	568	516	448	395	391
	4,274	3,783	3,357	2,968	2,737
Secondary power and energy	351	429	448	419	424
	4,625	4,212	3,805	3,387	3,161
Costs					
Operation, maintenance and administration	966	884	952	854	761
Fuel and fuel related ⁽¹⁾	1,143	1,210	1,169	1,094	951
Depreciation	655	476	396	348	321
	2,764	2,570	2,517	2,296	2,044
Income before financing charges	1,861	1,642	1,288	1,091	1,111
Financing charges					
Gross interest	2,551	2,322	2,012	1,708	1,371
Capitalized interest	(1,166)	(1,293)	(1,194)	(968)	(621)
Investment income	(60)	(80)	(58)	(67)	(8)
Foreign exchange	176	118	56	70	51
	1,501	1,067	816	743	700
Net income	360	575	472	348	400
Financial position					
Total assets	29,320	27,301	23,194	20,721	17,800
Fixed assets	24,149	22,147	19,948	17,600	15,440
Long-term debt	22,518	20,659	17,977	15,882	13,600
Equity	4,444	4,084	3,509	3,037	2,660
Source and use of cash⁽¹⁾					
Cash from operations	1,055	1,088	950	686	700
Cash from financing	757	1,756	1,823	2,172	1,710
Investment in fixed assets	2,541	2,624	2,746	2,885	2,100
Financial indicators					
Debt ratio ⁽²⁾	.830	.833	.840	.845	.8
Cash flow coverage ⁽³⁾	1.02	.96	.88	.89	1.0
Interest coverage ⁽⁴⁾	1.14	1.25	1.24	1.20	1.3

	1985	1984	1983	1982	1981
verage revenue⁽⁵⁾		in cents per kilowatt-hour of total energy sales			
mary power and energy					
Municipal utilities	3.754	3.440	3.210	2.981	2.710
Rural retail customers	5.561	5.143	5.027	4.475	4.269
Direct industrial customers	3.154	2.896	2.740	2.614	2.290
secondary power and energy	4.098	4.037	3.768	3.895	3.838
classifications combined	3.879	3.586	3.409	3.203	2.945
verage rate increases		expressed as a per cent			
Municipal utilities	8.5	8.0	8.2	9.6	9.3
Rural retail customers	8.7	7.5	8.8	8.7	11.2
Direct industrial customers	8.8	7.6	8.5	10.0	9.6
verage cost⁽⁵⁾⁽⁶⁾		in cents per kilowatt-hour of energy generated			
draulic					
Operation, maintenance and administration	.186	.184	.159	.173	.149
Fuel—water rentals	.233	.164	.076	.073	.066
Depreciation and financing charges	.399	.384	.345	.360	.351
	.818	.732	.580	.606	.566
clear					
Operation, maintenance and administration	.481	.506	.491	.487	.411
Fuel—uranium	.426	.361	.357	.384	.232
Depreciation and financing charges	2.018	1.330	1.026	.883	.807
	2.925	2.197	1.874	1.754	1.450
fossil					
Operation, maintenance and administration	.415	.348	.368	.402	.374
Fuel—coal, gas and oil	2.609	2.500	2.417	2.328	2.097
Depreciation and financing charges	.882	.597	.586	.683	.611
	3.906	3.445	3.371	3.413	3.082

notes

- (1) Figures for 1981-1984 have been reclassified to conform with the 1985 financial statement presentation.
- (2) Debt ratio represents debt (bonds and notes payable, short-term notes payable, other long-term debt, and accrued irradiated fuel disposal and fixed asset removal costs less unamortized foreign exchange gains and losses) divided by debt plus equity.
- (3) Cash flow coverage ratio represents funds provided from operations plus net interest, and interest charged to fuel for electric generation less interest on accrued provisions divided by interest on bonds, notes, and other debt.
- (4) Interest coverage represents net income plus interest on bonds, notes, and other debt divided by interest on bonds, notes, and other debt.
- (5) Figures for 1985 are preliminary.
- (6) Average cost per kilowatt-hour represents the costs attributable to generation but excludes the costs related to transmission, distribution and corporate administrative activities. These figures reflect the historical accounting costs of operating facilities and the actual energy generated by these facilities during the year.

**Ontario Hydro
Comparative Statistics**

	1985	1984	1983	1982	1981
in millions of kilowatt-hours					
Customer statistics⁽¹⁾					
Primary energy sales					
Municipal utilities	77,017	74,279	70,601	67,019	66,416
Rural retail	14,235	13,867	12,825	12,867	12,783
Direct industrial	17,963	17,817	16,348	15,119	17,077
	109,215	105,963	99,774	95,005	96,276
Secondary energy sales	8,565	10,627	11,900	10,753	11,063
in thousands					
Total Ontario customers					
Residential	2,707	2,652	2,604	2,559	2,528
Farm	106	107	108	110	110
Commercial and industrial	353	346	339	335	329
	3,166	3,105	3,051	3,004	2,967
in kilowatt-hours per customer					
Average annual use					
Residential	10,800	10,590	10,149	9,976	9,852
Farm	22,618	22,556	21,389	21,135	20,731
Commercial and industrial	215,000	212,700	200,436	194,376	204,575
in cents per kilowatt-hour					
Average revenue					
Residential	5.39	5.02	4.69	4.34	3.96
Farm	5.74	5.24	4.87	4.50	4.11
Commercial and industrial	4.01	3.74	3.50	3.28	2.92
Operating statistics					
Dependable peak capacity ('000 kW) ⁽²⁾	28,224	26,612	25,269	24,906	24,598
December primary peak demand ('000 kW)	20,473	18,052	18,792	16,872	16,600
Primary energy made available ('000,000 kW.h)	116,049	112,293	106,071	100,836	101,653
Total staff, average for year (includes regular and temporary staff)	31,166	29,613	31,233	32,654	30,855

Footnotes

(1) Figures for 1985 are preliminary.

(2) Includes mothballed generation: 1985 - 3,932,700 kW; 1984 - 3,999,200 kW;
1983 - 3,783,200 kW; 1982 - 3,034,200 kW; and 1981 - 1,913,000 kW.

Board of Directors**	Officers**	Regional Directors**	Committees of the Board of Directors**
Gordon Bell, Thornhill Chairman, Ontario Hydro; Deputy Chairman, President and Chief Operating Officer, Bank of Nova Scotia	Chairman of the Board Tom Campbell	Central Region H.K. (Hal) Wright (to April 30, 1985) 5760 Yonge Street Willowdale M2M 3T7	Finance T. Campbell (Chairman) J.A.G. Bell J.B. Cronyn A.E. Diamond M. Nastich L.N. Savoie
Jur J. Bowker, Ottawa Chairman, Research Officer, National Research Council (retired April 30, 1985)	Vice-Chairman J.A. Gordon Bell	C.G. (Gord) Sanford (from May 1, 1985)	Audit A.E. Diamond (Chairman) I. Harper (Vice-Chairman) T. Campbell R.E. Cavanagh A.B. Cousins F.T. Cowan J.B. Cronyn A.G. Hearn
John Campbell, Toronto Chairman, Ontario Hydro	Deputy Vice-Chairman A. Ephraim Diamond	Eastern Region P.H. (Phil) Garlough (retired July 31, 1985) 420 Dundas Street East Belleville K8N 5C3	Management Resources J.A.G. Bell (Chairman) T. Campbell J.B. Cronyn J.W. Erickson O.J.C. Runnalls L.N. Savoie
Edward E. Cavanagh, Chairman, Chairwoman, Chairperson, Public Utilities Commission	Senior Executive Vice-President Patrick G. Campbell	D.A. (Don) Watson (from August 1, 1985)	Social Responsibility J.W. Erickson (Chairman) T. Campbell R.E. Cavanagh A.B. Cousins F.T. Cowan I. Harper A.G. Hearn
B. Cousins, Wallaceburg Chairman, President, Stamps Limited	Executive Vice-Presidents E.H. (Ted) Burdette	Georgian Bay Region F.A. (Al) Perttila 93 Bell Farm Road Barrie L4M 1H1	Technical Advisory O.J.C. Runnalls (Chairman) T. Campbell J.W. Erickson I. Harper M. Nastich
Tom Cowan, Mount Brydges Chairman, President (retired May 1, 1985)	Planning and Administration Sam G. Horton Engineering and Services	Northeastern Region C.G. (Gord) Sanford (to May 31, 1985) 590 Graham Drive North Bay P1B 8L4	
B. Cronyn, London Chairman, John Labatt Limited	Vice-Presidents Ron W. Bartholomew Finance	G.R. (Bud) Barrett (from June 1, 1985)	
Ephraim Diamond, Toronto Deputy Vice-Chairman, Ontario Hydro; President, Castle Investments Limited	L.A. (Vern) Coles Regions (retired May 1, 1985)	Northwestern Region J.D. (Jack) Hamer 34 Cumberland Street North Thunder Bay P7A 4L5	
W. Erickson, London Chairman and Solicitor	H.K. (Hal) Wright Regions (from May 1, 1985)	Western Region Dr. David A. Drinkwater 1075 Wellington Road London N6E 1M1	
Mal Harper, Toronto Chairman, President, Mal Harper Inc.	C.S. (Cliff) Elliott Human Resources		
Robert G. Hearn, Agincourt Chairman, President, Ice Employees International Union	H. Allen Jackson Production		
John Nastich, Toronto Chairman, Ontario Hydro	Dane B. MacCarthy Marketing		
John C. Runnalls, Toronto Chairman, Centre for Nuclear Engineering, and Professor of Energy Studies, University of Toronto	John G. Matthew Supply and Services		
Edward N. Savoie, Ste. Marie, President and Chief Executive Officer, Ontario Central Railway	Lorne G. McConnell Power System Program		
James A. Stewart, London Chairman and Former Minister of Agriculture for Ontario (retired March 31, 1985)	William G. Morison Design and Construction		
	J.B. (Jim) Smith Corporate Relations		
	General Counsel and Secretary Lawrence E. Leonoff		
	Treasurer Dirk Peper		
	Corporate Comptroller Ian R. Russell		

* Milan Nastich retired December 31, 1985;
Robert C. Franklin became President in early 1986.

Credits

Design:
Haughton Brazeau Design Associates Limited, Toronto, Ontario

Typeetting:
Cooper & Beatty Limited
Toronto, Ontario

Colour Separations:
Empress Litho Plate Ltd.
Scarborough, Ontario

Printing:
Arthur-Jones Lithographing Ltd.
Mississauga, Ontario

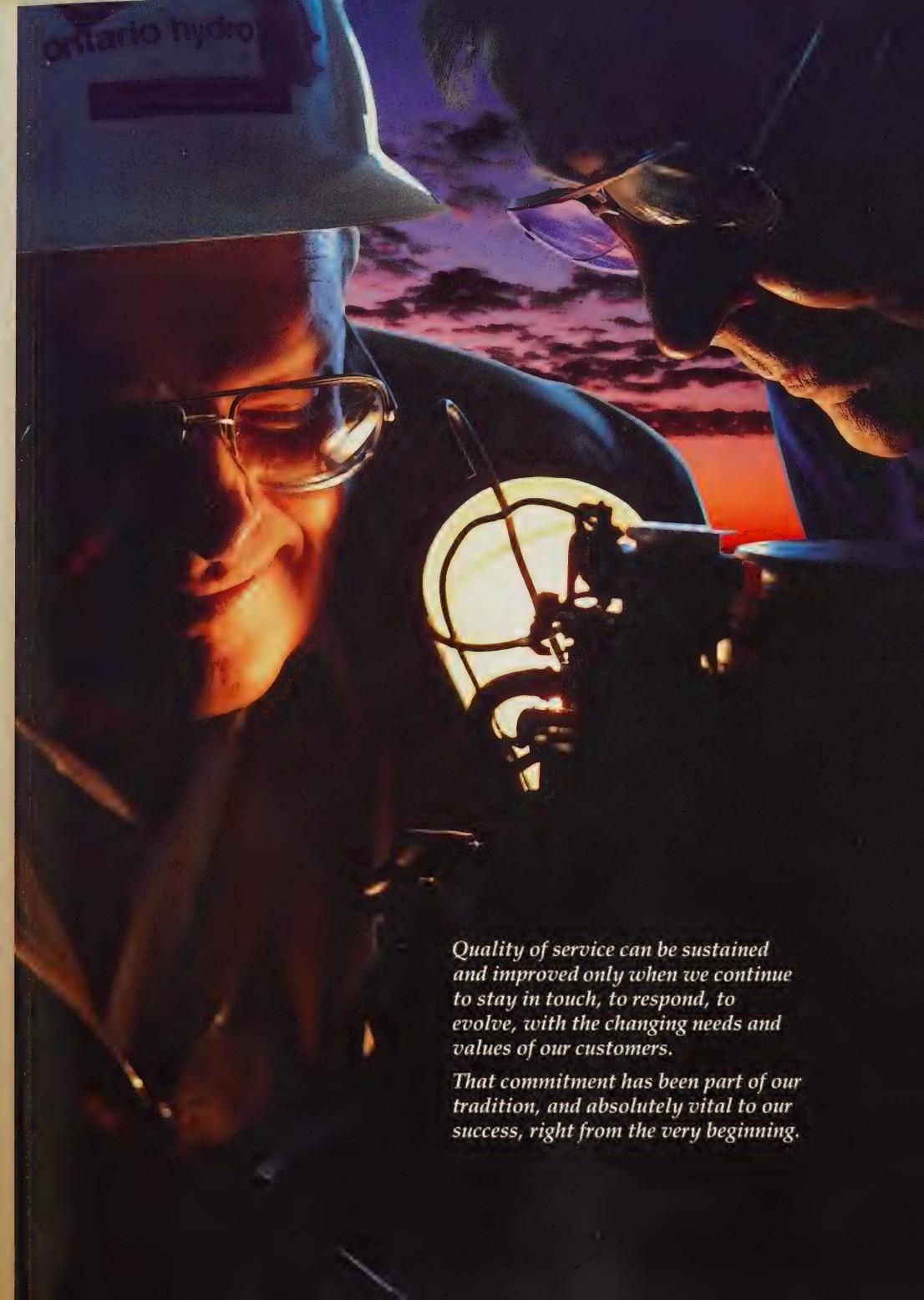


Ontario Hydro
Head Office
700 University Avenue
Toronto, Ontario
M5G 1X6

G M 1986

Ontario Hydro
Annual Report 1986

CA 20N
EP
- A55
cap. 2



*Quality of service can be sustained
and improved only when we continue
to stay in touch, to respond, to
evolve, with the changing needs and
values of our customers.*

*That commitment has been part of our
tradition, and absolutely vital to our
success, right from the very beginning.*

Ontario Hydro
700 University Avenue
Toronto, Ontario
M5G 1X6

Contents	Page
Financial Highlights	2
Corporate Profile	2
Customer Service and Satisfaction	3
Message from Chairman	6
Message from President	7
1986 in Review	9
Financial Section	25
Management Report	32
Five-Year Summary of Financial Statistics	46
Comparative Statistics	48

Front Cover

*Customer Robert Chapman
(right) from eastern Ontario
discusses his new electricity
supply with Customer Service
Supervisor Kevin Leach.*

*Ontario Hydro's
Board of Directors'
Report for 1986*

To:

The Honourable Vincent G. Kerrio
Minister of Energy

Ontario Hydro's Board of Directors submits to you
this report of the financial position and relevant
Ontario Hydro activities for the year 1986.

We thank you and Ministry of Energy staff for the
cooperation extended during the year.

On behalf of the Board,



Tom Campbell
Chairman
April, 1987

	1986	1985
		(millions of dollars)
Revenues	4,853	4,625
Net Income	247	360
Total Assets	31,357	29,320
Investment in Fixed Assets	2,523	2,541

The Corporation

Ontario Hydro is a corporation without share capital created by a special statute of the Province of Ontario in 1906. It now operates under the authority of the Power Corporation Act, R.S.O. 1980, Chapter 384, as amended, with broad powers to generate, supply and deliver electric power throughout the province. It is also authorized to produce and sell steam and hot water as primary products. The Corporation's prime objective is to supply the people of Ontario with electricity at the lowest feasible cost consistent with high safety and quality of service standards.

Ontario Hydro sells wholesale electric power to municipal utilities in urban areas who, in turn, retail it to customers in their service areas. Ontario Hydro also serves directly more than 100 large industrial customers and 813,189 rural retail customers in areas or communities not served by municipal utilities. In 1986, approximately 3,241,000 customers were served by Ontario Hydro and the municipal utilities in the province.

Ontario Hydro operates 81 hydraulic, fossil and nuclear generating stations and an extensive power grid across Ontario to meet the province's demands for electric energy. Interconnections with other power systems place the Corporation in a far-ranging electrical grid that covers a large segment of the North American continent.

In addition, Ontario Hydro exercises certain regulatory functions over municipal utilities as well as the approval and inspection functions for electrical equipment (in conjunction with the Canadian Standards Association) and electrical wiring installations throughout the province.

Ontario Hydro is a financially self-sustaining corporation. The Province of Ontario guarantees bonds and notes issued to the public by the Corporation.

Ontario Hydro's head office is located at 700 University Avenue, Toronto, Ontario. For administrative and operational purposes, six regional and 48 area offices are maintained throughout the province.

The business and affairs of Ontario Hydro are directed and controlled by a board of directors consisting of a chairman, vice-chairman, a president, and not more than 10 other directors. All of the members of the Board, who represent a broad spectrum of Ontario society, are appointed by the Lieutenant Governor in Council of the province except the president who is a full-time employee of the Corporation appointed by the Board.

To assist the Board in directing the Corporation's affairs, there are five Committees of the Board: Finance, Audit, Management Resources, Social Responsibility, and Technical Advisory. These committees review and make recommendations to the Board on matters within their terms of reference.

It was the search for a better way to meet Ontario's growing energy needs that led to the establishment of Ontario's first publicly owned electric utility in 1906.

At that time, electricity was becoming an important element in the development of Ontario. However, few could afford the high cost of power service provided by the existing privately owned companies. Moreover, that service was unreliable and it was limited to only certain areas in the province.

Increasingly, many electricity customers and would-be customers voiced their dissatisfaction with the private power companies. Soon, cities were rallying for public power under the leadership of Adam Beck, the man who was to become the first chairman of Ontario's Hydro-Electric Power Commission, known today as Ontario Hydro.

The mandate of that Hydro-Electric Power Commission was clear: to provide customers with a reliable supply of electricity at a reasonable cost. For 80 years, we have been doing just that. In the process, we have taken on new responsibilities and learned new skills to meet the needs of an evolving economy and society. For the first 70 years of our operation, the demand for electricity grew at a rapid rate, averaging over seven per cent a year. Industries grew, farms became larger and more mechanized, and homes and commercial operations relied increasingly on electrical appliances.

But energy consumption patterns began changing in the 1970s. The effect of the OPEC oil embargo contributed to a weakening of the global economy. Interest and inflation rates soared. For the first time since World War II, the demand for energy declined as the price continued to rise.

These economic changes contributed to changes in society's attitudes and values. Energy became a number one public concern. Conservation of natural resources, together with preservation of the environment, became paramount public values. Unchecked increases in energy consumption and high electricity load growth came to an end. And customer satisfaction no longer depended solely upon a low-cost reliable supply of electricity.

Other elements of electrical service became priorities. Electricity customers became more interested in using electricity efficiently. They also wanted to ensure that electricity was generated with minimum disruption to the environment. And they started to take a real interest in the planning and operations of Ontario Hydro.



Dieter Heins (left) of Ontario Hydro, Michael Farquhar (middle) of the Harbour Castle Hilton, and David Etier of Toronto Hydro discuss the Hilton's electricity costs. Ontario Hydro staff worked with hotel engineering staff to reduce electricity consumption by 33 per cent. More efficient lighting and better use of off-peak power for water heating have produced annual savings of \$450,000.

1910s

Ontario Hydro Research Laboratories develop energy efficient lightbulb.

1920s

Power from Sir Adam Beck I hydroelectric station begins flowing into the system; construction of Sir Adam Beck II begins. These stations are the cornerstones of Ontario Hydro's hydroelectric system and still produce electricity today for less than a penny per kilowatt hour.

1930s

Ontario Hydro develops first insulated water heater, setting new standards for energy saving water storage.

1940s

After a long absence, Ontario Hydro begins generating electricity again after the war ends. New hydroelectric dams are built, including the Beauharnois Dam, which generates enough electricity to power 100,000 homes.



4

Doug Gowing polishes a table at the Andrew Malcolm Furniture Company in Listowel, where fine hardwoods are dried in kilns fired by heat pumps. The process uses 40 per cent less energy than the conventional drying.

Today, these elements of electricity service remain important to the customer and to Ontario Hydro. We are always looking for a better way to meet Ontario's energy needs. And right now, just as it was a short decade ago, the better way to meet Ontario's energy needs includes improving the efficiency of electricity use and increasing our efforts to protect the environment. In addition, Ontario Hydro must continue to stay in touch with customers' changing energy needs and values, both to meet their present electricity needs and to anticipate their future needs.

Helping our customers use energy efficiently today continues to be a commitment of some magnitude. What is important to one customer is not necessarily as important to another. Some customers value comfort and convenience first, some prize guaranteed reliability, others want environmental protection at all costs, while still others are concerned mainly with lowering their energy bills. Most believe all the above are important; hence the need for Ontario Hydro to provide a service that balances these various priorities.

To do that, Ontario Hydro, with our municipal electrical utility associates, is increasing the flexibility of services offered. We are increasing numbers and types of energy service so that electricity consumers can determine for themselves where, when and how they will use their electricity.

1950s

Ontario Hydro standardized entire province on 60 Hertz frequency for more efficient and versatile electricity supply.

1960s

Insulation and vapour barriers promoted as part of "Live Better Electrically" campaign. Today, these efforts have resulted in thousands of well-insulated, energy efficient electrically heated buildings and homes.

1970s

Nuclear stations come into service generating electricity safely and economically. Ontario Hydro undertakes all appliance testing for federal government's Energuide program. To date, customers have saved approximately \$1.2 billion dollars in energy.

1980s

Ontario Hydro emphasizes better energy management through more flexible energy options such as cogeneration. Planning for future energy needs begins.

Right now we offer a number of energy management options that increase energy efficiency and give customers better value for every energy dollar. These options include residential water heating, heat pumps, commercial radiant heat, industrial plasma induction technologies, and industrial electrochemistry.

We are also exploring the possible application of other options like time-of-use rates, strategic conservation, load management, industrial cogeneration and renewable energy alternatives such as solar power. As we continue to know more about our customers' energy needs and values, we can develop more and better programs tailored to satisfy their specific energy requirements.

Similarly, as we continue to learn more about our environment, our environmental protection programs become more effective. Ontario Hydro has always worked hard to maintain water quality, to preserve lands and to protect fish populations and wildlife that might be affected by its operations. We are also making every effort to continue reducing sulphur and nitrogen oxide emissions, the gases from our coal-burning stations that contribute to acid rain.

Our efforts are becoming more effective; acid gas emissions have declined by 37 per cent over the last two years. We will continue to improve our environmental protection programs while maintaining reasonable electricity rates and reliable service to meet the demands of today's electricity customer.

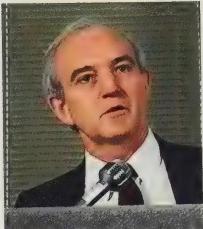
But Ontario Hydro's commitment doesn't end with satisfying the needs of today's electricity customer. We must anticipate also the needs of tomorrow's electricity customer. And we cannot do that without consulting first with the people of Ontario.

Since the late 70s, Ontario Hydro has been building a reputation as a corporate leader in consulting with the public about the planning, building and operating of its power facilities. At present, as part of our planning for Ontario's future energy needs, we are in the process of conducting a comprehensive public consultation program including discussions with provincial community leaders and dozens of provincial organizations.

Meeting our customers' energy needs while respecting their values is very important to Ontario Hydro. Whether it is encouraging energy efficiency, protecting the environment, or ensuring a secure supply of electricity for the future, Ontario Hydro's search for a better way to meet Ontario's energy needs is more than a series of programs or processes. It involves an attitude basic to all of Ontario Hydro's activities, and a dedication to customer satisfaction.



Michael Mokohonuk (left), plant foreman at E. B. Eddy's Pulp and Paper Mill in Espanola, and Rolly Racicot, Customer Service Supervisor at Ontario Hydro's northeastern regional office, inspect a finished roll of paper. E. B. Eddy now produce their own electricity with hydraulic generators. They have also approved the purchase of a 25 MW steam turbine to complete their cogeneration project.



Chairman Tom Campbell at the official opening of the Municipal Electric Association's new head office in Toronto.

At Ontario Hydro, customer service and satisfaction is a tradition. Eighty years ago, Adam Beck, Ontario Hydro's first chairman, made a commitment to provide the people of Ontario with a reliable supply of power at cost. Over the years, that commitment has remained fundamental to all of our activities, and is the foundation of customer satisfaction.

To provide electricity at a cost and in a manner that our customers find acceptable, we must continually strengthen our relationship with our customers. Only by staying in touch and evolving with the changing needs and values of our customers can we sustain and improve the quality of our service.

Today, Ontario Hydro, together with the municipal electrical utilities, serves over three million customers with different energy needs and priorities. These needs and priorities must be balanced with Ontario Hydro's overall responsibility to supply the people and economy of Ontario with a reliable source of low-cost electricity.

During 1986, with a strengthening economy, the demand for electricity increased by 3.7 per cent. Electricity demand is expected to continue growing as the economy grows, even though electricity is being and will be used more efficiently. A reliable and low-cost electricity supply, as well as energy efficient electrical applications, are very important to Ontario as they help attract new investment to the province. In the past few years alone, the number of automotive manufacturing plants locating in Ontario has increased significantly.

Ontario Hydro must also ensure a secure supply of electricity for the future. With the completion of the Darlington Generating Station in 1992 and the high-voltage transmission facilities in eastern and southwestern Ontario, we will have enough electricity to meet our customers' most probable demand for electricity through to the late 1990s. However, careful planning takes time, so we have started looking at our customers' probable needs beyond the 1990s. During 1986, Ontario Hydro, with customer consultation, proceeded with a major study of demand and supply options for meeting future electricity needs. This study, when complete, will lay out the options of electricity supply for Ontario well into the twenty-first century.

To meet our customers' needs now and in the future, we rely on the skill, dedication and commitment of Ontario Hydro's people. I would like to thank all of our employees, as well as our Board of Directors and our partners, the municipal electrical utilities, for helping us to serve the electricity consumers of Ontario.

Serving our customers well has always been important to Ontario Hydro. Over the years, good service has become more complex and now extends far beyond restoring electrical interruptions quickly. Today, customer satisfaction depends upon our ability to provide an electrical energy service that not only improves working and living conditions, but also reduces electricity bills and energy consumption. To do this, we must get to know our customers and their energy needs better.

This year, Ontario Hydro continued translating what it is learning about customers' expectations into several new programs designed to increase the flexibility of our services. We introduced the Energy Advisory Service to help householders use electricity more efficiently. A new department was established to assist industrial customers better. We are working more closely with industrial customers in all regions of the province, looking for ways to improve their electricity service, and increase their industrial competitiveness through the application of energy efficient electrical processes. In short, Ontario Hydro is working toward becoming as much an energy consultant as an electricity producer and distributor. Helping our customers use electricity efficiently has become a vital element of good service.

Affordable electricity rates is another important element of good service. We have always believed that, and our customers continue to tell us that. Ontario Hydro's ability to keep rates low and reliability high is a testament to the efficiency and effectiveness of our operations and management.

The Corporation's actions to improve and broaden its customer services took place in a stable financial environment. Total revenues for the year were higher than in 1985 but net income dropped because of increased financing charges as new generating facilities were brought into service and because of reduced exports. Both the amount and price of electricity exported to the United States dropped sharply because of falling oil prices and strong competition among Canadian utilities. The decline in net income in 1986, however, has not affected Ontario Hydro's ability to meet its interest payments or debt repayment obligations. Ontario Hydro's annual investment in fixed assets has steadily decreased since 1982 with cash from operations continuing to represent a significant portion of that investment. This trend toward greater internal financing is expected to continue as current major capital programs near completion.

I'd like to thank all Ontario Hydro employees for their continuing commitment to the people of this province, as well as their personal support during my first year as President. Their efforts have maintained Ontario Hydro's reputation as a world-class electric utility that does more than keep the lights on.



From left to right: Arvo Niittenberg, Executive Vice-President, Operations; Sam Horton, Executive Vice-President, Human Resources, Engineering and Services; Ted Burdette, Executive Vice-President, Finance and Planning, and Robert Franklin, President.

At Bishop Scalabrin Catholic School in York Region, electrical rooftop heat pumps heat and cool the twenty-classroom building at a cost far below the projected energy budget for conventional energy sources. In fact, as a result of reduced energy costs, the school's operating costs are among the lowest in York Region.



"The school is quiet and has the most comfortable environment I have ever experienced. The air inside the classrooms is always fresh and the even temperature is conducive to happier and more responsive attitudes in the students."

Charles McCarthy
Principal

Year in Review

In 1986, as the provincial economy continued to improve, the primary demand for electricity increased by 3.7 per cent.

Ontario Hydro's rural retail system alone added more than 18,000 new customers, bringing the total number to 813,189. This 2.3 per cent increase in the number of rural retail customers continues the upward trend of the past five years. In all, Ontario Hydro delivered 126.6 billion kilowatt-hours of electricity to its customers, including 6.0 billion kilowatt-hours supplied to utilities outside of Ontario, chiefly in the United States.

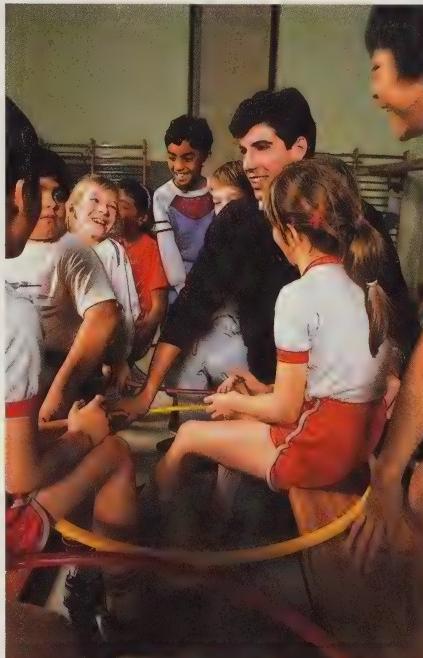
Peak demand also climbed. Since large amounts of electricity cannot be stored, Ontario Hydro carefully monitors consumption peaks so that the utility can supply its customers on the coldest, darkest evenings of the year. The 1986 peak demand was 20.7 million kilowatts.

Ontario Hydro produces the electricity required by its customers from three primary sources: falling water, uranium and coal. In 1986, water power supplied 29.4 per cent of the total energy resources, for a total of 37.2 billion kilowatt-hours. The average kilowatt-hour produced from existing hydraulic stations costs .86 cents. As most of Ontario's water power was developed before 1960, few opportunities for developing additional large and economical hydraulic stations now exist in the province. However, Ontario Hydro is investigating the development of additional small hydraulic sites.

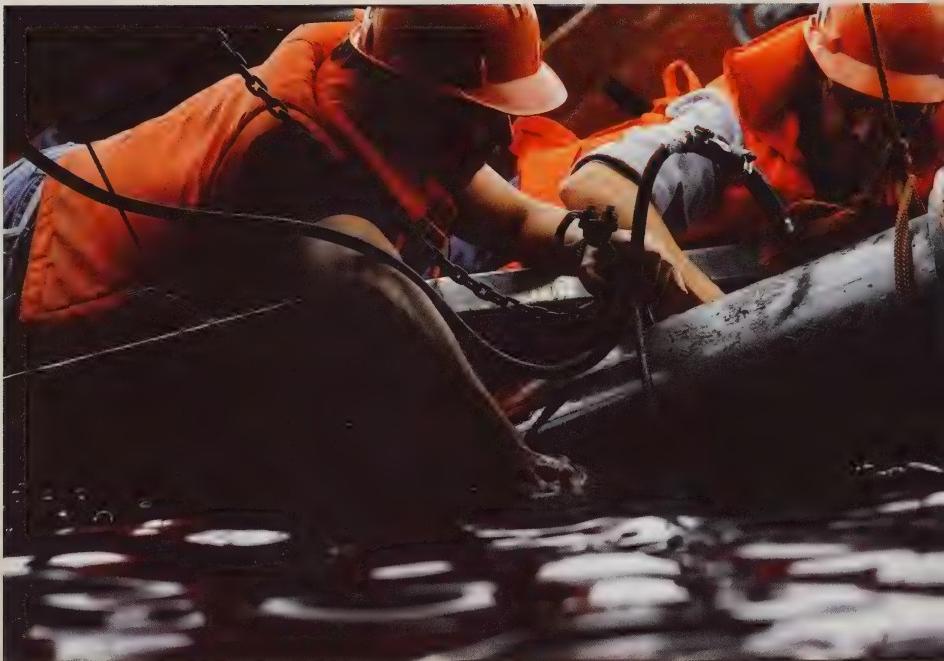
Nuclear generation, now Ontario Hydro's principal source of electricity, provided 46.0 per cent of Ontario's electricity, for a total 58.2 billion kilowatt-hours. Nuclear generated power helps keep Ontario Hydro's electricity rates low. A kilowatt-hour of nuclear power costs an average 3.0 cents, compared with an average 4.73 cents from a coal-burning unit.

Coal-burning plants are Ontario Hydro's third major source of power, supplying 18.9 per cent of the province's electricity in 1986 for a total of 24 billion kilowatt-hours. These plants provide Ontario Hydro with the flexibility required to respond to fluctuations in peak load or outages at other generating plants.

In addition to generating electricity, Ontario Hydro buys power from other utilities, chiefly from Quebec and Manitoba to help meet customer demand. In 1986, these purchases provided 5.7 per cent of Ontario Hydro's electricity requirements, or 7.2 billion kilowatt-hours, at a cost of \$128 million. In October, the Corporation announced an agreement with Hydro Quebec to purchase up to 1200 megawatts of electricity, as required, between December 1986 and March 1987. This agreement also allows Ontario Hydro to strengthen reliability in the eastern part of the province's power system for 1987.



Energy efficient design combined with an energy efficient electric heating system has created a comfortable learning environment year-round for Bishop Scalabrinii School children.



Ontario Hydro researchers demonstrate to Hydro Quebec the use of a 'fish pulsar' in repelling juvenile American chad. Ontario Hydro pioneered the design which uses sound to divert or guide fish away from water intakes to areas of safe passage.

While Ontario Hydro's construction program has been winding down since 1982, Ontario Hydro's construction activity was marginally higher in 1986 than in 1985. Purchases of goods and services for construction and operations increased by \$57 million to \$1,034 million. Contract awards rose from \$712 million in 1985 to \$794 million. In total, 81 per cent of these orders were placed with Canadian companies, mostly in Ontario.

As would be expected, as Ontario Hydro's construction program declines, its need for long-term financing diminishes. Between 1982 and 1986, net borrowings dropped from \$2,172 million to \$1,710 million.

Assuring Reliability

During 1986, Ontario Hydro's employees coped with several unexpected disruptions to the electrical system. On March 10, freezing rain across much of southern Ontario led to "flashovers" on the 500-kilovolt transmission system and forced a cut in the output from the Bruce Generating Stations. The loss was largely overcome by increasing the output from other generating resources and purchasing power from neighbouring utilities. Interruptions occurred only for those industrial customers whose contracts permit the curtailment of supply.

In July, a tornado touched down in Haliburton County, leaving 6,000 customers without electricity. Crews from Minden and several neighbouring areas repaired the damaged lines. On August 7, Ottawa's Centretown was blacked out by a fire in the Slater Transformer Station. Ontario Hydro and Ottawa Hydro staff restored power to about half the interrupted customers from adjacent stations within four hours. Full service was restored 56 hours

after the initial disruption despite difficult circumstances and adverse weather conditions. Ontario Hydro, with the help of the local municipal utilities, began extensive studies into the incident to reduce the probability and duration of a total station interruption to a level as low as is reasonably achievable.

Keeping Rates Reasonable

Ontario Hydro works hard to keep its operating costs minimal to keep electricity rates as low as possible, while meeting its commitment to provide dependable service. The 1987 average rate increase of 5.5 per cent, announced in the fall of 1986, keeps our rate levels among the lowest in the world. The cost of electricity in this province is below power rates in most North American cities, and virtually all European and Far Eastern countries. By keeping rates reasonable, Ontario Hydro also helps Ontario attract and maintain industrial development and economic activity.

Talking with Our Customers

Ontario Hydro's interest in understanding the needs and values of its customers better was demonstrated in 1986 through an array of customer-oriented activities, many of them connected with the Corporation's study of meeting Ontario's future energy needs.

Initiated in 1984, this study will guide Ontario Hydro's planning decisions for the next several years, and includes extensive surveys of public views and direct consultations with the public. The largest single customer-attitude survey in Ontario Hydro's history involved face-to-face interviews with 1,200 residential, 200 commercial and 200 industrial customers. Customers ranked reliable service, reasonable rates and environmental protection as priorities in that order. In another survey, Ontario Hydro asked over 800 customers for their views on meeting Ontario's electricity needs in an environmentally sound manner. The survey asked the customers what tradeoffs they were prepared to make to meet the reliability and price objectives. Overall, customers responded that protecting the environment was as important as a reliable, low-cost electricity supply.

Also as part of this future needs study, Ontario Hydro continued to meet with public interest groups, provincial community leaders and municipal utilities to explore a broad range of concerns.

In addition to its own public consultation programs, Ontario Hydro officials appeared before a number of hearing bodies, including the Ontario Energy Board, the National Energy Board, and the Joint Board under the Consolidated Hearings Act. Ontario Hydro also appeared before the federal Special Committee on Acid Rain in May 1986. As well, the Corporation appeared before the Select Committee on Energy established by the provincial legislature. In August, the Ontario Cabinet approved two of the Select Committee's chief recommendations: completion of Darlington Generating Station; and the establishment of an independent review of the safety of the design and operation of the CANDU reactor. During 1986, Ontario Hydro spent approximately 90,600 hours, or 60 person-years, and almost \$6 million participating in public hearings.

Average Cost of Generation



Ontario Hydro marketing representative, Madelon Gordon, (left) consults with Willie Casteels of Port Perry. Mr. Casteels has installed infrared electric brooders to raise his 230,000 broilers. The result has been more precise heat control, higher productivity, and lower costs.



"We heat our barns electrically. Right from the start we have, part of the reason being that it is a very versatile product. It is also a reasonable-cost energy source."

Will Nap
Napri Farms

The Corporation's contact with the public increased in other areas. More than 85,000 people visited Ontario Hydro's information centres located at the Bruce, Darlington, Lakeview, Lambton, Nanticoke, Niagara Falls, Pickering, Saunders, and Thunder Bay Generating Stations. Ontario Hydro's Speakers' Bureau arranged 531 speaking engagements to community, business and service groups throughout the province. Ontario Hydro also prepared a sequel to the well-received videotape series "Watts Up?"

Meeting Our Customers' Electricity Needs

Nuclear Generation

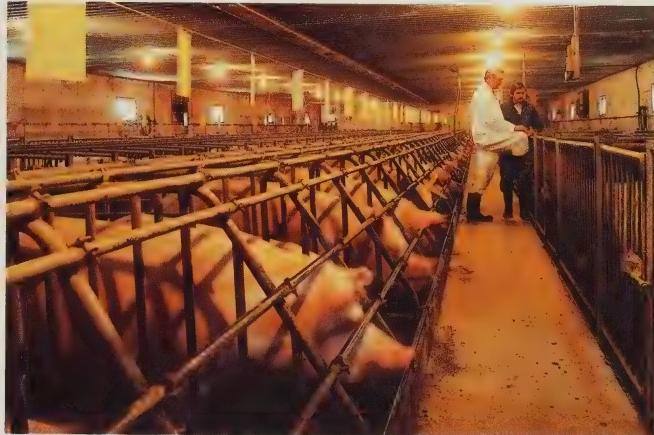
Ontario Hydro's nuclear energy program continues to be safe and economical. During 1986, work progressed on several facilities in place or under construction.

The most active site was Darlington, where the station's first reactor is scheduled to come on stream in 1988. When it is finished, Darlington will provide 3,600 megawatts, enough power to meet the needs of a population the size of metropolitan Toronto. All Darlington units are scheduled to be in service by 1992.

Darlington will also house Ontario Hydro's new Tritium Removal Facility. Tritium, a mildly radioactive isotope of hydrogen, gradually accumulates in the heavy water used in operating Canadian deuterium uranium (CANDU) reactors. The process of isolating and extracting tritium from tritiated heavy water will increase the safety of our CANDU station employees. This facility should begin operating in 1987.

In 1986, the Atomic Energy Control Board granted Ontario Hydro a licence for the design and manufacture of containers for the bulk transportation of tritiated water. The Tritiated Heavy Water Transport Package, as it is called, holds 5,000 litres and will be used when the Tritium Removal Facility at Darlington begins operating. The AECB also granted Ontario Hydro a licence for the design and manufacture of containers for the bulk transportation of used nuclear fuel.

On February 28, Unit 8 of the Pickering Nuclear Generating Station was declared in service. This station, on the shore of Lake Ontario, now has a total capacity of 4,300 megawatts. Units 1 and 2, however, have been shut down since 1983, when cracks in pressure tubes were discovered. By the end of 1987, all pressure tubes in both units will have been replaced and the units returned to service.



Ontario Hydro works closely with agricultural customers to improve electrical energy use in farming operations. Will Nap of Thornton (right) with the help of Harold Parker decided electricity was the most effective heating source for the farrowing operation on his pig farm.



14

Ontario Hydro technician Grant Edwards installs a Lyman-Alpha hygrometer to check acid rain deposits north of Toronto. Careful monitoring is essential in tracking Ontario Hydro's progress in reducing sulphur and nitrogen oxide emissions.

Work on the Bruce Generating Station "B" near Lake Huron, also approached completion. Unit 7 came on line in April 1986, and the final reactor, Unit 8, should begin delivering power by mid-1987.

Nuclear Safety and Performance

The accident in April at the Soviet Union's Chernobyl nuclear station raised a number of questions about the design and operation of Ontario Hydro's nuclear stations. Ontario Hydro provided extensive information to the public and media on plant design, the intensive training of Ontario Hydro's nuclear staff and Ontario Hydro's commitment to worker and public safety.

Unlike Chernobyl, Ontario Hydro's nuclear generating stations have fast shutdown and vacuum systems which ensure safe operation and prevent emissions from escaping into the atmosphere. CANDU units also rely on heavy water, rather than the inflammable graphite used at Chernobyl to moderate fission in the reactor's core.

CANDU reactors have distinguished themselves as the best in the world. At the end of 1986, four Ontario Hydro CANDU units ranked in the top 10 in lifetime performance among 277 commercial reactors worldwide.

One of the most important safeguards at Ontario Hydro's nuclear stations is the well-trained people who run these facilities. The training program for our nuclear operators is lengthy and rigorous, and makes extensive use of control

room simulators. This year Ontario Hydro completed a retrofit of the Bruce "A" training simulator, declared the Bruce "B" training simulator in service, and continued upgrading the Pickering "A" simulator. The Darlington simulator will be delivered by mid-1987.

Ontario Hydro's nuclear employees' record for working safely is excellent. In 1986, these employees extended their record to 32 years without an on-the-job fatality. Furthermore, in 1986 the total units of radiation received by the Corporation's nuclear operating staff remained low, even though the energy output of our nuclear stations increased substantially.

Coal-fired Generation

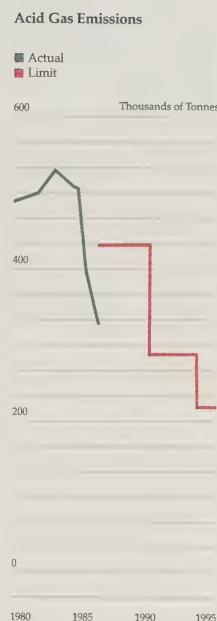
Coal-fired stations play a unique role in Ontario Hydro's generation mix, supplying the additional power required when all available nuclear and hydraulic units are running. This is especially vital during the peak demands of winter.

Ontario Hydro is examining the merits of refurbishing some of its older coal-fired generating stations. For example, a study is in progress on the cost-effectiveness of rehabilitating the 25-year-old Lakeview Generating Station in Mississauga to increase its reliability and extend its service life.

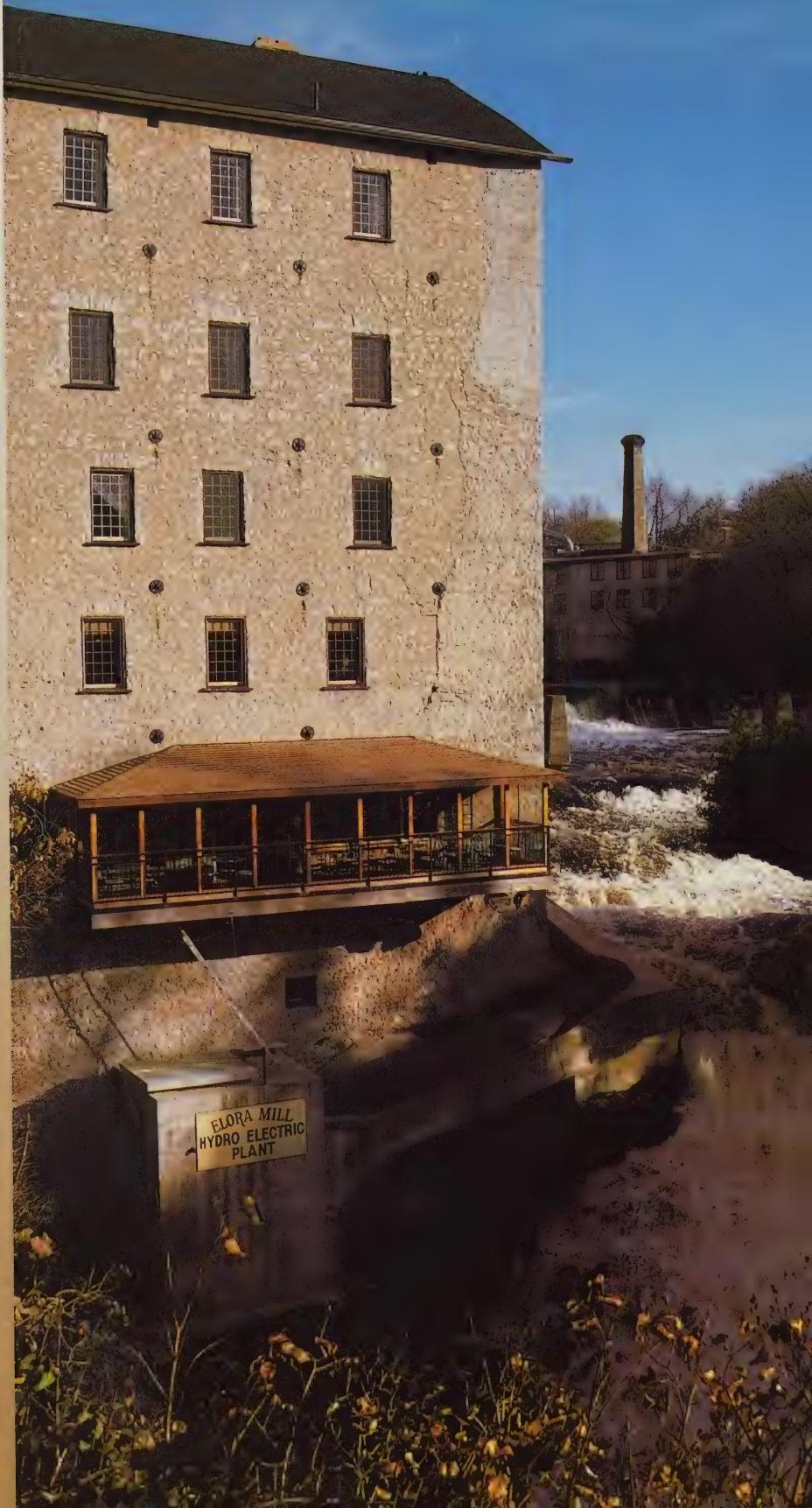
Even as it works to meet Ontario's growing demand for reliable, reasonably priced electricity, the Corporation is mindful of its responsibility to minimize the effect of its operations on the environment. Ontario Hydro's acid gas reduction program is significantly lowering levels of sulphur dioxide and nitrogen oxide emissions. In 1986, emissions totalled 320,000 tonnes, about 19 per cent below 1985 levels and 37 per cent below 1984 levels. Ontario Hydro is cooperating with provincial government regulations limiting emissions to 215,000 tonnes by 1994 - 60 per cent below the 1982 peak levels.

The Corporation's multi-faceted acid gas control program is flexible, designed to achieve reductions at the lowest possible cost to its customers. Measures include washing coal to lower its ash and sulphur content; burning lower sulphur coals; relying on more nuclear generated power; purchasing electricity from neighbouring utilities; and installing low nitrogen oxide burners at the Nanticoke Generating Station. There, a 35 per cent reduction in nitrogen oxide emissions for the five units retrofitted to date has been achieved with only minor losses in combustion efficiency. The program will continue through 1987 and 1988 with the conversion of the last three units.

As well, Ontario Hydro is considering scrubbers (devices that remove sulphur dioxide from flue gases). Over the next three years, we are spending \$7.7 million for work required to obtain approval under the Environmental Protection Act to install flue gas desulphurization (FGD) equipment as needed at our three largest thermal generating stations. Four potential processes will be evaluated: limestone injection; a lime spray dryer process; a limestone dual alkali process; and wet limestone scrubbing. The plan is to have an appropriate technology approved and ready for installation to meet the Ontario Government acid gas regulations beyond the mid-90's. Ontario Hydro has more than satisfied the government's current regulations and is confident that it will continue to do so.



As part of the renovation of Elora Mill, a 140-kilowatt hydraulic generator was installed to serve the Mill's electricity needs. This parallel generation project will pay for itself in eight years, and was part of the Ontario Ministry of Energy's mini-hydro program.



"Generating my own power has worked out well. I use approximately two-thirds of what I produce and sell the rest. It has taken about three years to smooth out this project. Both Ontario Hydro and Elora Hydro have been very cooperative."

Crozier Taylor
Owner
Elora Mill

Hydraulic

During 1986, the Corporation continued to explore the possibility of establishing or expanding hydraulic facilities at sites on the Little Jackfish, Mattagami and Niagara Rivers.

A hydraulic station on Little Jackfish River, which flows into Lake Nipigon, would produce 132 megawatts and could be in service as early as 1993. Studies are in progress to assess

the project's environmental effects. Plans to construct additional facilities on the Mattagami River must await the outcome of Ontario Hydro's negotiations with a private company for the Smoky Falls water rights. Meanwhile, Ontario Hydro is exploring the possible environmental effects connected with the Mattagami proposal. The Corporation is also investigating the possibility of making more efficient use of the water in the Niagara River, possibly by adding a third station.

In addition, Ontario Hydro worked on several hydraulic stations, including Stewartville and Crystal Falls, to extend their service lives. As well, a preliminary engineering study on redeveloping the Big Chute Generating Station was initiated.

Alternate Energy Options

While hydraulic, nuclear and coal remain the primary sources of Ontario Hydro's electricity supply, the Corporation is exploring a broad range of other options such as small hydraulic development, cogeneration, and wind and solar energy.

Ontario Hydro is encouraging the private development of small hydraulic sites and has formed a task force to assist interested individuals and firms. As well, Ontario Hydro is working to make the cogeneration of electricity a more attractive prospect for Ontario companies. Typically, cogeneration involves the production of heat and electricity from a single fuel source. In Ontario, pulp and paper industries could be chief participants in cogeneration applications. Discussions with pulp and paper firms indicate that more than 100 megawatts of their electricity demand might be met through cogeneration.

Wind and Solar Energy

For Ontario, wind-generated electricity is practical only in a few northern settlements, where air currents are strong and the cost of other power sources is high. This year, after extensive tests, Ontario Hydro began installing a 60-kilowatt wind turbine in Fort Severn, a remote native community in northern Ontario. This turbine is paired with a diesel generator, which relies on fuel brought in by airplane.



Elora Hydro-Electric Commission representative Art Hoffer (far left), Harold Chambers (middle left) and Ontario Hydro representative Ken Dougan (far right) worked with the Mill's owner, Crozier Taylor (middle right).



18

At McConnell Lake control dam, technicians Don Fraser (left) and Al Morton lower a pendulum to measure structural changes within the body of the dam. Ontario Hydro's dam safety program monitors structures carefully to ensure that changes due to fluctuating temperatures and water levels are within acceptable limits.

A second experimental program also came to fruition in 1986 with the construction of Canada's largest solar-powered generator. Ontario Hydro erected a 10-kilowatt photovoltaic system in the community of Big Trout Lake in northwestern Ontario. Both the photovoltaic cells and the inverter, which converts the array's direct current to alternating current, were manufactured in Canada.

Delivering Electricity

In addition to generating electricity, Ontario Hydro must be able to deliver electricity where it is needed, when it is needed. During 1986, Ontario Hydro continued to seek approval to expand its transmission systems in all sections of the province. In southwestern Ontario, hearings concluded on the routing of three 500-kilovolt lines. These lines are needed to permit the full output of the Bruce Generating Station to supply customer demand, improve the reliability of supply in southwestern Ontario, and facilitate electricity interchanges with Michigan. The Hearings Board approved a plan in early 1987.

In the north, the construction of a new 500-kilovolt line between Hanmer Transformer Station, north of Sudbury, and Mississagi Transformer Station, west of Elliot Lake, is well under way. This link, which will operate initially at 230-kilovolts, should be finished by December 1987.

Route selection studies have started to locate a new direct current transmission line between Sault Saint Marie and Thunder Bay. This new line will strengthen the interconnection between the east and west parts of the province and improve the power supply to northwestern Ontario.

In eastern Ontario, progress was made toward building two 500-kilovolt lines between the Lennox Generating Station, near Kingston, and Hawthorne Transformer Station just outside of Ottawa. By year-end, tower layout and field construction had begun for the first line, which is scheduled for service in October 1989. Ontario Hydro has received approval for a future 500-kilovolt line from St. Lawrence Transformer Station, near Cornwall, to Hawthorne Transformer Station.

East of Toronto, construction proceeded on a second 500-kilovolt line from the Darlington Generating Station to Cherrywood Transformer Station. This line is scheduled to begin service in mid-1987.

Ontario Hydro's People

Overall staff levels at Ontario Hydro are expected to be relatively stable over the next few years, at about 24,000. The decrease in staff associated with the decline in design and construction activity is being offset by increasing staff levels required to support growing production and distribution functions. This shift in staff requirements is being managed successfully as shown by a 100 per cent redeployment rate for staff declared surplus in 1986.

1986 was not a bargaining year for the contract between the Corporation and the Ontario Hydro Employees Union (OHEU); however preparations for the 1987 negotiations began. As well, in 1986, Ontario Hydro successfully negotiated 18 collective agreements covering employees involved in construction work for the bulk power system.

Another development affecting many of Ontario Hydro's people is the drive for certification of the Society of Ontario Hydro Professional and Administrative Employees. This group, representing some 6,600 administrative, supervisory, engineering, and other professional staff, filed its application to become a certified trade union with the provincial Labour Relations Board in November.

This year, the Corporation continued its efforts to improve the working relationships between employees, their representative bodies, and management. Last year, Ontario Hydro launched the Working Relationships Program. The first results of that initiative were announced in April 1986 when a team of consultants presented a report on working relationships at Ontario Hydro. The Corporation is working on putting the report's recommendations into practice.

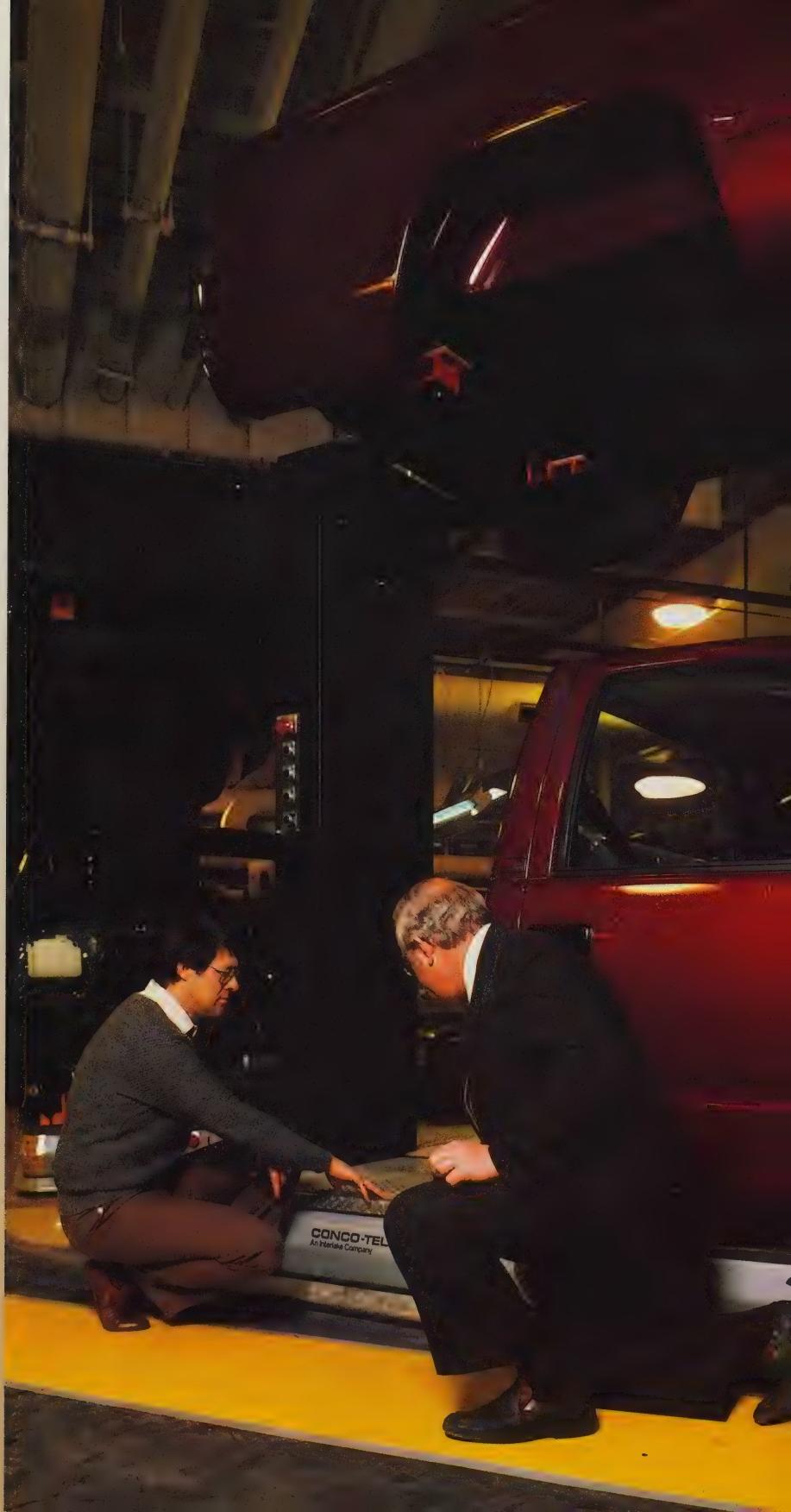
Affirmative Action

During 1986, Ontario Hydro's affirmative action initiatives continued to facilitate the movement of qualified women into non-traditional and managerial occupations. Women entering traditionally male-dominated trade, technical and operating occupations increased to 346 from 294. The number of women in Management and Professional positions increased to 531 from 445.



Lise Belanger, one of Ontario Hydro's foresters, trims trees away from distribution lines in Timmins.

Jerry Goreski (left) of General Motors and Doug Tideman of Ontario Hydro examine the new automated guided vehicle system at this truck plant in Oshawa. Using the latest electrotechnologies, the system incorporates state-of-the-art quality control and improves productivity.



"Expanding our facilities in Oshawa doubled our electricity requirements. We really appreciated the ability of Ontario Hydro's people to supply us with power when and where we needed it to meet our expansion deadlines."

Bill Sterling
Director, Plant Engineering
GM Canada

And the number of women in Executive Salary Roll positions rose to 19 from 10. Of the total staff, 4,251 were women compared with 3,968 women last year.

This year, Ontario Hydro's Affirmative Action Department also organized and hosted an affirmative action conference. Eighty people representing company employees and affirmative action practitioners from across Canada met to discuss issues related to current affirmative action activities.

Ontario Hydro was also one of four companies to win a 1986 Employment Equity Award presented by the provincial government for affirmative action efforts.

Employment Health and Safety

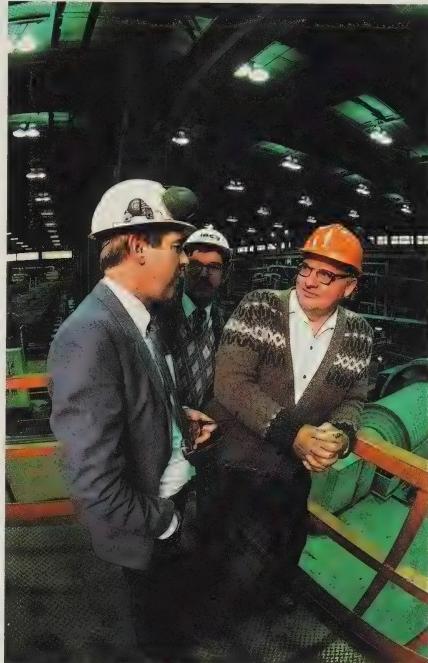
Ontario Hydro continued its unwavering efforts to keep its workplace safe. A number of this year's accomplishments deserve mention. For the second consecutive year, there were no on-the-job fatalities or permanent total disability accidents. As well, the Darlington construction project became the first major construction site ever to receive a three-star rating from the International Loss Control Institute for the quality of its safety program.

Also, the Health Services Department completed an epidemiology study of forestry tradesmen and concluded there is no evidence of increased cancer mortality risk associated with long-term employment in the forestry trade. In another area, an extensive, three-year study of computer visual display units concluded that there was no evidence of any serious health risks from the units. And Ontario Hydro is working toward smoke-free offices by the end of 1987.

Becoming More Customer Oriented

Ontario Hydro's marketing program was established as a separate service three years ago to help facilitate the Corporation's strong commitment to customers. Ontario Hydro, with the help of our largest customer group, the municipal utilities, serves a broad range of electricity consumers, including some 3,241,000 householders, farmers, cottagers, commercial customers and industrial firms. The Corporation's marketing efforts are aimed at responding to customers' needs and helping them use energy efficiently.

Ontario Hydro broadened the range of programs it offers customers under the EnerMark label. EnerMark, launched in 1985, provides a common identity for all members of the electrical industry including the utilities, contractors, manufacturers and consultants promoting the wise use of energy in Ontario. Among the new or ongoing EnerMark projects in 1986 were a loan program for homeowners, a toll-free enquiry line, and information booths at various major exhibitions around the province.



Lloyd Strong (left) and Mick Throssell (middle) of INCO and Tom Armstrong of Ontario Hydro discuss using electricity to increase production capacity in ore-crushing operations. A demonstration project at INCO's Clarabelle Mill in Sudbury has been funded by INCO, Ontario Hydro, the Ministry of Energy, and REXNORD Limited to confirm the benefits of variable speed drives in on-line crushers.



22

At Dorval, Ontario Hydro demonstrates to Hydro Quebec its newly developed process for converting PCBs, recovered from electrical insulating oils, into harmless compounds. Because the process is mobile, the PCB trailer can eventually be operated for businesses and utilities across the province.

During 1986, the Corporation strengthened several initiatives designed to assist homeowners. The Energy Advisory Service was introduced to build on the activities of Ontario Hydro's Residential Energy Advisory Program (REAP). This service counsels householders on the efficient use of electricity and provides them with a survey of their homes' energy consumption.

The Corporation sought to improve service for homeowners in other ways. Ontario Hydro introduced a new data base system to handle billing and enquiries from retail customers. Staff now can respond far more quickly and fully to questions from rural retail customers. As well, meter readers were issued hand-held microcomputer recorders to replace the old pen-and-paper method of recording meter information. This new system is more efficient because the reader can transfer data directly to Ontario Hydro's central computers. It is also more accurate because of built-in validity checks.

Commercial and Industrial Customers

Other marketing programs were aimed at the commercial market, including offices, retail complexes, schools, hospitals and multi-residential buildings. The Commercial Energy Manual, first issued in 1985, went into a second printing this year as a result of customer demand. The volume, popularly known as "The Source," is a comprehensive guide to electrical design in commercial buildings. Of particular interest to contractors, engineers and architects, it provides useful information on how electricity can be the basis for an efficient energy management system. A second volume, dealing with further commercial applications, will be ready for publication early in 1987.

To a greater degree than ever before, Ontario Hydro's marketing strategy in 1986 addressed the needs of industrial customers. Low-cost, reliable electrical energy has long made this province attractive to new business.

The Corporation is determined to maximize that advantage. To this end, during 1986, Ontario Hydro established the Major Accounts Department to provide a primary focal point between Ontario Hydro and the province's large industries. The Department works closely with government to attract new businesses to Ontario and help existing businesses remain competitive.

Another 1986 initiative to increase customer satisfaction was the establishment of the Industrial Marketing Training Program. A comprehensive 12-week course designed in conjunction with the Laurier Institute of Sir Wilfrid Laurier University, it helps marketing and regional staff better understand industrial operations so they can help them use energy as a production component more effectively. More than 40 staff members graduated from this course during the year.

Ontario Hydro is particularly proud of its cooperation with the automotive industry and the role that economical, dependable power has played in bringing new plants to Ontario. Numerous automotive manufacturers, including General Motors, American Motors, Toyota, Honda, and GM/Suzuki, announced plans to build major new facilities in the province or dramatically expand existing centres.

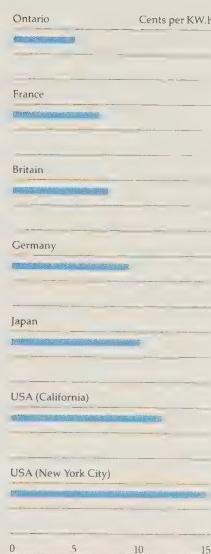
In conjunction with the Ontario Ministry of Energy, Ontario Hydro launched a program to help industry make more efficient use of forms of energy such as electricity, gas and steam through the technology of energy monitoring. Four to six companies will be invited to participate in this demonstration project. Ontario Hydro will help install in each firm an energy monitoring system that will measure the use of various forms of power as well as the output of each profit centre or production line.

Using such detailed information, Ontario Hydro's experts will assist industrial customers in identifying opportunities for increasing productivity. Based on preliminary results, a typical monitoring system will cost \$150,000 and have a payback period of one year. Average annual energy savings should be in the order of 16 per cent.

Northern Customers

One area receiving particular attention from Ontario Hydro's marketing staff in 1986 was northern Ontario. For some of the area's major industries such as pulp and paper, steel production and mining, energy bills can account for as much as 15 to 20 per cent of total costs. The Corporation is working closely with these companies to reduce their energy costs through energy management, cogeneration and electrotechnology.

**Comparative Electricity Price
for Industrial Consumers
(1985)**



Other Ontario Hydro Services

In 1984, Ontario Hydro consolidated its non-energy related revenue-producing activities in a separate, entrepreneurial unit called the New Business Ventures Division. Its activities benefit all electricity customers within Ontario since net income from these activities is applied against the cost of producing electricity and thus helps to keep rates low.

Sales of the isotopes, Cobalt-60 and deuterium gas, rose sharply in 1986. Ontario Hydro produces about 75 per cent of the world's Cobalt-60, which is used in cancer therapy and the sterilization of medical products. Shipments of this isotope were up 30 per cent over 1985. Moreover, the division has opened markets for another isotope, deuterium gas, which is used in biological research and medical products.

New Business Ventures also provides industrial and utility customers with a means to dispose of polychlorinated biphenyls (PCBs), found in electrical insulating oil, through the use of Ontario Hydro's mobile PCB decontamination unit. This year MPU-1, as the mobile unit is called, successfully completed its first commercial contract, decontaminating 38,000 litres of oil in Nova Scotia. Hamilton-based Rondar Industries Inc. operates the equipment under a leasing arrangement with Ontario Hydro. Approval to operate this unit in Ontario is expected early in 1987.

Ontario Hydro also sells its technological expertise in control room simulators, equipment testing and nuclear services to the United States and countries in Asia and Africa. New Business Ventures' international consulting work has grown substantially, with Ontario Hydro staff working with Canadian consultants and industries around the world. This year, the Corporation secured a major contract for a five-year program to train transmission workers in Egypt. In China, Ontario Hydro technicians are training operators for a coal-fired station being built at Nantung, and are helping build a transmission system in the southwest part of the country. Other Ontario Hydro teams are teaching lines and maintenance workers in Pakistan, providing management training in Ghana, and helping plan energy use in Kenya.

Continuing Customer Commitment

In summary, at home and abroad the watchword for Ontario Hydro is customer satisfaction. The Corporation is determined to provide a dependable supply of electricity at the lowest rates possible, and to remain attuned to the needs and values of its customers. Ontario Hydro's customer orientation was strengthened in 1986, and will continue to shape the Corporation's actions in the future.

**Financial Review of Ontario Hydro**

for the year ended December 31, 1986

Financial Highlights

Ontario Hydro's activities continue to be directed at achieving its primary purpose of providing the customers of Ontario with electricity at the lowest feasible cost over the long term consistent with high safety and quality of service standards. To accomplish this, Ontario Hydro encourages the effective use of resources and emphasizes productivity improvements and cost control.

Ontario Hydro's total revenues for 1986 amounted to \$4,853 million, \$228 million higher than in 1985. Approximately \$53 million of this increase came from a greater volume of electricity sales, and \$175 million from the 1986 rate increase. Total operating costs for 1986, including financing charges, amounted to \$4,606 million, an increase of \$341 million over 1985. The major factor in this increase in total operating costs for 1986 was new generating units placed in service in 1986 and 1985. To smooth the effect of this overall increase, the 1986 electricity rate increase provided for a level of net income lower than the level for 1985. The net income for 1986 was \$247 million compared with \$360 million for 1985.

Cash provided from operations and available for investment in fixed assets was \$1,040 million for 1986. The capital expenditures for investment in fixed assets during 1986 amounted to \$2,523 million. This represents a steady decline from the 1982 level of \$2,885 million as a result of the decrease in the level of construction activity.

Results of Operations**Revenues**

Primary revenues for 1986 amounted to \$4,605 million, an increase of \$331 million or 7.7 per cent as compared with 1985. Electricity sales to municipal utilities, rural retail, and direct industrial customers totalled 114,763 million kilowatt-hours. The overall growth rate in the volume of primary energy sales was 3.7 per cent for 1986, reflecting the effect of continued economic growth in the Province of Ontario. In 1986, electricity sales to municipal utilities and rural customers grew more strongly than sales to direct industrial customers. The chart (see page 26) provides the energy consumption by major customer category and an estimate of the energy consumed by market sector. The overall growth rate for 1986 was higher than the average annual growth rate of 3.4 per cent over the last five years.

The 1986 electricity rates for primary customers increased 4.0 per cent on average. The average increases for municipal utilities, rural retail and direct industrial customers were 4.0 per cent, 3.8 per cent and 4.3 per cent, respectively. The rural rate increase takes into account \$64 million in assistance provided by all electricity consumers in the province to reduce the electricity bills of year-round rural residential customers.

Secondary revenues for 1986, mainly from sales of electricity to United States utilities, amounted to \$248 million. Compared with 1985, this represents a decrease of \$103 million or 29.3 per cent. This decrease is a result of price competition among Canadian utilities for the midwestern and northeastern U.S. markets and lower oil prices for U.S. electric utilities which makes imports less attractive for them.

Over the last five years, Ontario Hydro has earned approximately \$1,895 million in revenues from United States utilities by selling electricity beyond the requirements of its customers in Ontario. The net benefit to Ontario customers was \$736 million for the period 1982 through 1986, and \$104 million in 1986. This benefit helped Ontario Hydro to keep electricity rates lower for Ontario customers.

Major Electricity Production Resources

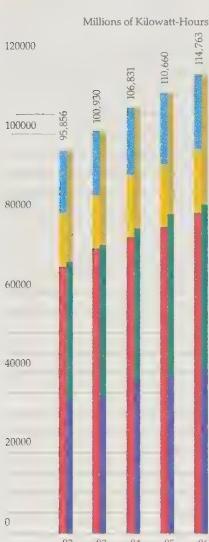
Ontario Hydro responds instantly and efficiently to the energy demands of its customers by supplying electricity from a number of different sources. Hydraulic generating stations, which are relatively inexpensive to operate, have traditionally provided a major part of the electricity energy generated by Ontario Hydro. With most major accessible sites in the province already developed, hydraulic generation, as a percentage of total generation, has gradually decreased over the past few years although the volume of electricity



Primary Energy

Customer Category Market Sector

- Direct
- Residential
- Municipal
- Commercial
- Industrial



generated has remained relatively stable. On the other hand, the Corporation has increased its emphasis on nuclear generation. This emphasis is part of Ontario Hydro's acid gas emission reduction efforts. The other major source of generation of electricity is fossil generation. Due to the relatively high cost of fossil fuels, Ontario Hydro relies on its fossil-fuelled stations primarily to meet its needs for peaking power. The electricity production resources for the period 1982 through 1986, illustrating the changes in volume and generation mix, are shown in the chart below. The annual average costs per kilowatt-hour of energy by the major generating sources are shown in the Five Year Summary of Financial Statistics.

Fuel and Fuel-related Costs

In 1986, fuel and related costs such as water rentals, power purchased, and the nuclear agreement-payback were 4.7 per cent lower than in 1985. Ontario Hydro's nuclear stations supplied 46.0 per cent of the total energy to the system in 1986. Hydraulic stations supplied 29.4 per cent and fossil-fuelled generation provided 18.9 per cent. Purchases of power from interconnected utilities provided the remaining 5.7 per cent. In 1985, electric energy from nuclear generation, hydraulic generation and fossil-fuelled generation supplied 39.0 per cent, 30.0 per cent and 23.9 per cent, respectively, of the total energy to the system.

The 1986 fuel costs for coal and uranium amounted to \$933 million, a decrease of 3.6 per cent over 1985. The decrease is mainly due to the replacement of higher-cost coal by more economical uranium. This more than offsets the effect of the increased volume of electricity generated to meet increased demand and the higher unit fuel costs. The increase in electricity provided from nuclear sources reflects the additional units placed in service in 1986, and also the full year's production from nuclear units placed in service in 1985.

The payments Ontario Hydro makes primarily to the Province of Ontario for the use of provincial waters in its hydraulic plants amounted to \$91 million in 1986, an increase of \$4 million over 1985.

Electricity purchased from neighbouring utilities amounted to \$128 million in 1986, a decrease of \$35 million over 1985. These purchases are generally made during peak demand periods or emergency situations so as to maintain a reliable supply of electricity.

In 1986, units 1 and 2 of the Pickering Nuclear Generating Station were not operating, having been taken out of service in 1983 to replace existing pressure tubes. The maintenance and overhead costs during the shutdown period have been included in the payback calculation according to the Pickering Payback Agreement. As a result, Ontario Hydro was able to reduce its 1986 and 1985 operating costs by \$63 million and \$75 million respectively, which represents the amount to be offset against future amounts payable by Ontario Hydro to Atomic Energy of Canada Limited and the Province of Ontario, the other two parties to this agreement.

Operation, Maintenance and Administration

The costs associated with the operation, maintenance and administration of the Corporation in 1986 were \$1,014 million, an increase of \$48 million over 1985. This increase of 5.0 per cent is primarily related to placing new facilities in service, and cost increases due to inflation. The continued emphasis on cost control at all levels of the Corporation is having a positive financial impact on operation, maintenance and administration costs. The in-service capacity of the generation system grew about 5 per cent or 1,277 megawatts in 1986. The major component of this growth is the addition of two nuclear generating units. The transmission and distribution system work-load also grew in 1986, as reflected in an increase of approximately 2 per cent in the number of customers and an increase of about 1 per cent in the kilometres of rural lines maintained. The costs of transmission and distribution, and administration and support services



as a percentage of the total of operation, maintenance and administration costs declined slightly in 1986, while the generation component increased slightly. The chart shows the operation, maintenance and administration costs by major activity for the period 1982 through 1986.

Depreciation

The depreciation charged to operations totalled \$705 million in 1986, \$50 million or 7.6 per cent higher than in 1985. Contributing to this increase were the additional facilities placed in service, including Pickering unit 8, Bruce unit 7, and the full year's impact of Pickering unit 7 and Bruce unit 5 and the Atikokan Generating Station having been placed in service in 1985. This increase was partially offset by two fossil-fuelled generating stations becoming fully depreciated by the end of 1985.

Financing Charges

Financing charges are comprised of interest and foreign exchange costs. Interest charged to operations represents the total cost of borrowing less interest capitalized. This is designed to effect a proper allocation of costs between current and future customers. Foreign exchange mainly represents the amortization of unrealized gains or losses on the principal amount of foreign debt.

Gross interest costs for 1986 amounted to \$2,684 million, an increase of \$133 million or 5.2 per cent as compared with 1985. The primary reason for this increase is related to the additional funds borrowed during the year to finance the construction of new generating stations which are needed to meet future demand.

Interest charged to operations amounted to \$1,585 million in 1986, \$260 million or 19.6 per cent higher than in 1985. The increase resulted primarily from placing additional nuclear generating units in service in 1986, and the full year's impact of units placed in service in 1985. The in-service date is the time from which interest is no longer capitalized and is charged to operations.

Foreign exchange costs amounted to \$213 million in 1986, an increase of \$37 million or 21.0 per cent over 1985. The primary factor contributing to the increase in foreign exchange costs was the effect of a weaker Canadian dollar relative to the United States dollar.

Net Income / Financial Indicators

Ontario Hydro earned a net income of \$247 million in 1986 compared with \$360 million in 1985. Ontario Hydro's main financial indicators are the debt, cash flow coverage and interest coverage ratios. The debt ratio at the end of 1986 was .835 as compared to the 1985 ratio of .830. The cash flow coverage for 1986 was 1.05, the highest level since 1981. The level of interest coverage for 1986 and 1985 were 1.09 and 1.14 respectively. The decrease in net income has not affected the Corporation's ability to meet its interest payments and debt repayment obligations in 1986. The financial position of the Corporation remains strong.

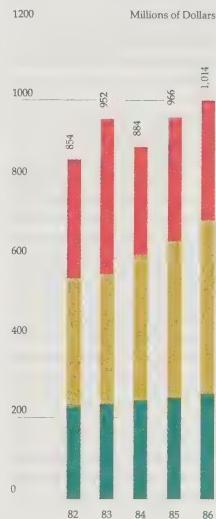
Capital Expenditures and Financing

Investment in Fixed Assets

Ontario Hydro invests in fixed assets to meet expected growth in the demand for electricity, to replace existing assets with facilities that are more economical, and to meet regulatory requirements. The total assets of the Corporation at the end of 1986 were \$31,357 million and of this amount, about 83 per cent consists of fixed assets in service and under construction. This relatively high percentage reflects the capital-intensive nature of Ontario Hydro's business.

Operation, Maintenance and Administration

- Administration and Support Services
- Generation
- Transmission and Distribution

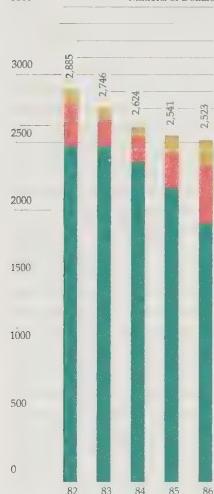




Investment in Fixed Assets during the Year

- Administration and Service Facilities
- Transmission and Distribution Facilities
- Generating Stations

3500 Millions of Dollars



The investment in fixed assets during 1986 was \$2,523 million. A major portion of the 1986 capital expenditures went toward the construction of new generating facilities. In addition, the 1986 capital expenditures reflect the continued emphasis being placed on investment in transmission and distribution facilities. The expenditures on major capital projects under construction during 1986 and 1985 were:

	1986	1985
millions of dollars		
Nuclear Generation		
Pickering	34	137
Bruce	279	417
Darlington	1,131	999
Fossil Generation		
Atikokan	—	109
Generating Facilities	1,444	1,662
Transmission & Distribution	422	249

Ontario Hydro placed in service unit 8 at Pickering and unit 7 at Bruce in February and April, 1986, respectively. The total cost was \$2,451 million, including \$492 million for heavy water.

There has been a modest decline in the annual investment in fixed assets from \$2,885 million in 1982 to \$2,523 million in 1986, as the major generating projects are completed. The expenditures for investment in fixed assets for the period 1982 through 1986 are shown in the chart.

Financing

Cash required by Ontario Hydro to finance the investment in fixed assets is provided from two major sources: cash provided from operations and cash from external borrowings. For 1986, cash provided from operations, and cash from financing were \$1,040 million and \$1,710 million respectively. Cash from borrowings represents the amount of cash provided from long-term debt less retirements.

The 1986 proceeds from long-term debt, net of retirements, of \$1,710 million was \$953 million higher than the 1985 amount of \$757 million. This increase in the net borrowings is primarily due to the timing of the issuance of debt over the 1986 and 1985 year ends and a reduction in the level of corporate liquidity during 1985. The proceeds from the issue of bonds sold to the public by Ontario Hydro during 1986 amounted to \$2,073 million, and the proceeds from the issue of bonds to the Province of Ontario with respect to Canada Pension Plan funds provided a further \$119 million. These proceeds were from ten Canadian issues with an average coupon interest rate of 9.2 per cent for an average term of 8.1 years. For the same period in 1985, the average coupon interest rate and the average term of new debt issued were 10.8 per cent and 9.0 years respectively. In addition, a 100 million Swiss franc bank loan (Canadian \$84 million) was entered into to refinance a Swiss franc bond issue, and proceeds of \$108 million were received from the issuance of long-term notes.

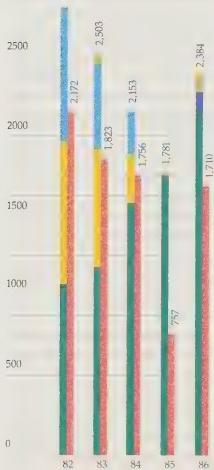
Cash provided from financing from 1982 through 1986 is shown in the chart. The principal markets Ontario Hydro has operated in are the Canadian, United States, and Eurodollar public markets. Financing activities for 1986, except for \$116 million, were met entirely from the Canadian market and from Canada Pension Plan funds to minimize foreign exchange exposure.

Cash amounting to \$321 million was used to retire maturing long-term debt in 1986, compared with \$849 million in 1985. In addition, during 1986, cash amounting to \$353 million was used to redeem debt prior to maturity, compared with \$175 million in 1985.

Cash Provided from Financing

- Eurodollar Issues
- U.S. Issues
- Canadian Issues
- Proceeds from Long-Term Debt
- Net of Retirements
- Other Debt Issues
- Canada Pension Plan Funds

3000 Millions of Dollars





The accompanying financial statements have been prepared in accordance with accounting principles generally accepted in Canada, applied on a basis consistent with that of the preceding year. The significant accounting policies followed by Ontario Hydro are described below.

Rate setting

Ontario Hydro has broad powers to generate, supply and deliver electric power throughout the Province of Ontario. The Corporation operates under the Power Corporation Act and is subject to provisions of the Ontario Energy Board Act.

Under the provisions of the Power Corporation Act, the price payable by customers for power is the cost of supplying the power. Such cost is defined in the Act to include the cost of operating and maintaining the system, depreciation, interest, and the amounts appropriated for debt retirement and stabilization of rates and contingencies. The debt retirement appropriation is the amount required under the Act to accumulate on a sinking fund basis over 40 years a sum equal to the debt incurred for the cost of the fixed assets in service. The appropriation for, or withdrawal from, the stabilization of rates and contingencies reserve is an amount established to maintain a sound financial position and to stabilize the effect of cost fluctuations.

Under the provisions of the Ontario Energy Board Act, a public hearing before the Ontario Energy Board is required in respect of any changes in electricity rates proposed by Ontario Hydro which affect its municipal utilities, direct industrial customers, or, if the Minister of Energy so directs, rural retail customers. The Ontario Energy Board submits its recommendations to the Minister of Energy. After considering the recommendations of the Ontario Energy Board, the Board of Directors of Ontario Hydro, under the authority of the Power Corporation Act, establishes the electricity rates to be charged to customers.

If the Board of Directors specifies a certain cost or gain is to be included in future electricity rates that, in accordance with the accounting policies summarized below, would be charged or credited to operations in the current year, then this cost or gain is deferred and amortized to future operations on a basis consistent with its inclusion in rates.

Fixed assets

Fixed assets in service include operating facilities and non-operating reserve facilities. Construction in progress includes fixed assets under construction and heavy water held for use in nuclear generating stations under construction.

Fixed assets are capitalized at cost which comprises material, labour, engineering costs, and the costs of training initial operating staff for new facilities as well as overheads, depreciation on service equipment, and interest applicable to capital construction activities. In the case of generation facilities, the cost also includes the net cost of commissioning, and for nuclear generation, the cost of heavy water. The net cost of commissioning is the cost of start-up less the value attributed to energy produced by generation facilities during their commissioning period. The cost of heavy water comprises the direct cost of production and applicable overheads, as well as interest and depreciation on the heavy water production facilities and the estimated removal costs of these facilities. For multi-unit facilities, a proportionate share of the cost of common facilities is placed in service with each major operating unit. Leases which transfer the benefits and risks of ownership of assets to Ontario Hydro are capitalized.

Interest is capitalized on construction in progress at rates (1986—12.9 per cent, 1985—13.9 per cent) which approximate the average cost of long-term funds borrowed in the years in which expenditures have been made for fixed assets under construction. If the construction period of a project is extended and the construction activities are continued, interest is capitalized during the period of extension provided that the project has a reasonable expectation of being completed.

If a project is cancelled or deferred indefinitely with a low probability of construction being resumed, all costs including the costs of cancellation are written off to operations.

If fixed assets are removed from operations and mothballed for future use, termed non-operating reserve facilities, the costs of mothballing are charged to operations.



Depreciation

The capital costs of fixed assets in service are depreciated on a straight-line basis. Depreciation rates for the various classes of assets are based on their estimated service lives. Major components of generating stations are depreciated over the lesser of the service life expectancy of the component or the remaining service life of the associated generating station.

The estimated service lives of assets for 1986 and 1985 in the major classes are:

Generating stations—hydraulic	—65 to 100 years
—fossil	—25 to 35 years
—nuclear	—40 years
Heavy water	—over the period ending in the year 2040
Transmission and distribution facilities	—20 to 55 years
Heavy water production facilities	—20 years
Administration and service facilities	—5 to 60 years

In accordance with group depreciation practices, for normal retirements the cost of fixed assets retired is charged to accumulated depreciation with no gain or loss being reflected in operations. However, gains and losses on sales of fixed assets, and losses on premature retirements are charged to operations in the year incurred as adjustments to depreciation expense.

When the costs of removal less residual value, termed removal costs, on retirements of fixed assets can be reasonably estimated and are significant, provisions for these costs, except for those related to heavy water production facilities, are charged to depreciation expense on an annuity basis over the remaining service life of the related fixed assets. For heavy water production facilities, provisions for removal costs are charged to heavy water production costs on a straight-line basis over the remaining service life of the related facilities. Other removal costs are charged to depreciation expense as incurred. Removal costs include the estimated costs of decommissioning nuclear stations and heavy water production facilities, and the estimated costs of removing certain nuclear reactor fuel channels.

The estimated service lives of fixed assets and the significant assumptions underlying the estimates of fixed asset removal costs are subject to periodic review. Any changes arising out of such a review are implemented on a remaining service life basis from the year the changes can be first reflected in electricity rates.

Non-operating reserve facilities are amortized so that any estimated loss in value is charged to depreciation expense on a straight-line basis over their expected non-operating period.

Unamortized advances for fuel supplies

As part of its program to ensure the adequate supply of fuels for its generating stations, Ontario Hydro has entered into long-term fuel supply contracts. Where these contracts require Ontario Hydro to make payments for pre-production costs to suppliers in advance of the fuel delivery, these payments and associated costs, including interest, are carried in the accounts as unamortized advances for fuel supplies. The advances are amortized to fuel inventory as the fuels are delivered.

Fuel for electric generation

Fuel used for electric generation comprises the average inventory costs of fuel consumed, charges for commissioning energy produced, and provisions for disposal of nuclear fuel irradiated during the period. The inventory cost of fuel consumed comprises fuel purchases, transportation and handling costs, and the amortization of advances for fuel supplies. Transportation costs include charges for interest and depreciation on railway equipment owned by Ontario Hydro. The charges for commissioning energy produced during the period represent the incremental operating and fuel costs of producing the same quantity of energy at generating units displaced because of the commissioning activity. The costs for disposal of nuclear fuel irradiated in each period are charged to operations based on estimated future expenditures and interest accumulating to the estimated date of disposal. Estimates of expenditures, interest and escalation rates, and the date of disposal are subject to periodic review. Adjustments resulting from changes in estimates are charged to operations on an annuity basis over the period from the year the changes can be first reflected in electricity rates to the estimated in-service date of the disposal facility.



Foreign currency translation

Current monetary assets and liabilities in foreign currencies are translated to Canadian currency at year-end rates of exchange and the resultant exchange gains or losses are credited or charged to operations. Long-term debt payable in foreign currencies is translated to Canadian currency at year-end rates of exchange. Resulting unrealized exchange gains or losses are deferred and included in unamortized debt costs, and are amortized to operations on an annuity basis over the remaining life of the related debt.

Foreign exchange gains or losses on hedges of long-term debt payable in foreign currencies are deferred and included in unamortized debt costs. The deferred gains or losses related to principal payments are amortized to operations on an annuity basis over the remaining period through to the year in which the hedged principal payments are due. The deferred gains or losses related to interest payments are credited or charged to operations in the year in which the hedged interest payments are due.

Foreign exchange gains or losses on early redemption of long-term debt are deferred and included in unamortized debt costs if the exposure in the foreign currency related to the redeemed debt is not reduced as a result of the refinancing of the redeemed debt in the same currency. These deferred gains or losses are amortized on an annuity basis over the period to the original maturity date of the redeemed debt. If the foreign currency exposure is reduced as a result of the early redemption of debt, the resulting foreign exchange gains or losses related to the redeemed debt are credited or charged to operations.

Unamortized debt costs

Unamortized debt costs include the unamortized amounts related to unrealized foreign exchange gains or losses resulting from the translation of foreign currency long-term debt, foreign exchange gains or losses on hedges, foreign exchange gains or losses on the early redemption of long-term debt, discounts or premiums arising from the issuance of debt or the acquisition of debt prior to maturity, and discounts or premiums accrued on foreign currency hedges.

Debt discounts or premiums arising from the issuance of debt are amortized over the period to maturity of the debt. Discounts or premiums on debt acquired prior to the date of maturity are amortized over the period from the acquisition date to the original maturity date of the debt. Discounts or premiums on foreign currency hedges are credited or charged to operations over the terms of the individual hedges.

Nuclear agreement—Pickering units 1 and 2

Ontario Hydro, Atomic Energy of Canada Limited and the Province of Ontario are parties to a joint undertaking for the construction and operation of units 1 and 2 of Pickering Nuclear Generating Station, with ownership of these units being vested in Ontario Hydro. Contributions to the capital cost by Atomic Energy of Canada Limited and the Province of Ontario amounted to \$258 million and these have been deducted in arriving at the value of fixed assets in service in respect of Pickering units 1 and 2. Ontario Hydro is required to make monthly payments until the year 2003 to each of the parties in proportion to their capital contributions. These payments, termed "payback", represent in a broad sense the net operational advantage of having the power generated by Pickering units 1 and 2 as compared with coal-fired units similar to Lambton units 1 and 2.

Pension plan

The pension plan is a contributory, defined benefit plan covering all regular employees of Ontario Hydro. Ontario Hydro is responsible for all deficiencies and surpluses in the pension plan. Pension costs, as actuarially determined, consist of current service costs and amounts required to amortize any surpluses or unfunded liabilities. A net unfunded liability arising from past service obligations is amortized up to fifteen years. All other net unfunded liabilities or net surpluses in the fund are amortized up to five years.

Research and development

Research and development costs are charged to operations in the year incurred, except for those related directly to the design or construction of a specific capital facility which are capitalized as part of the facility.



Management's Responsibility for Financial Reporting

The accompanying financial statements of Ontario Hydro are the responsibility of management and have been prepared in accordance with accounting principles generally accepted in Canada, applied on a basis consistent with that of the preceding year. The significant accounting policies followed by Ontario Hydro are described in the accompanying Summary of Significant Accounting Policies. The preparation of financial statements necessarily involves the use of estimates based on management's judgement, particularly when transactions affecting the current accounting period cannot be finalized with certainty until future periods. The financial statements have been properly prepared within reasonable limits of materiality and in light of information available up to March 9, 1987. The information presented elsewhere in the Annual Report is consistent with that in the financial statements.

Management maintains a system of internal controls designed to provide reasonable assurance that the assets are safeguarded and that reliable financial information is available on a timely basis. The system includes formal policies and procedures and an organizational structure that provides for appropriate delegation of authority and segregation of responsibilities. An internal audit function independently evaluates the effectiveness of these internal controls on an ongoing basis and reports its findings to management and to the Audit Committee of the Board of Directors.

The financial statements have been examined by Clarkson Gordon, independent external auditors appointed by the Lieutenant Governor in Council of Ontario. The external auditors' responsibility is to express their opinion on whether the financial statements are fairly presented in accordance with generally accepted accounting principles. The Auditors' Report, which appears below, outlines the scope of their examination and their opinion.

The Board of Directors, through the Audit Committee, is responsible for ensuring that management fulfills its responsibilities for financial reporting and internal controls. The Audit Committee meets periodically with management, the internal auditors and the external auditors to satisfy itself that each group has properly discharged their respective responsibilities, and to review the financial statements before recommending approval by the Board of Directors. The external auditors have direct and full access to the Audit Committee, with and without the presence of management, to discuss their audit and their findings as to the integrity of Ontario Hydro's financial reporting and the effectiveness of the system of internal controls.

On behalf of Management

President

Toronto, Canada,
March 9, 1987.

Executive Vice-President,
Finance and Planning

Auditors' Report

To the Board of Directors of Ontario Hydro:

We have examined the statement of financial position of Ontario Hydro as at December 31, 1986 and the statements of operations, equities accumulated through debt retirement appropriations, reserve for stabilization of rates and contingencies and source of cash used for investment in fixed assets for the year then ended. Our examination was made in accordance with generally accepted auditing standards, and accordingly included such tests and other procedures as we considered necessary in the circumstances.

In our opinion, these financial statements present fairly the financial position of Ontario Hydro as at December 31, 1986 and the results of its operations and the changes in its financial position for the year then ended in accordance with generally accepted accounting principles applied on a basis consistent with that of the preceding year.

Toronto, Canada,
March 9, 1987.

CLARKSON GORDON
Chartered Accountants

Ontario Hydro
Statement of Operations

for the year ended December 31, 1986



	1986	1985
millions of dollars		
Revenues		
Primary power and energy		
Municipal utilities	3,116	2,891
Rural retail customers	885	815
Direct industrial customers	604	568
	<u>4,605</u>	<u>4,274</u>
Secondary power and energy (note 1)	248	351
	<u>4,853</u>	<u>4,625</u>
Costs		
Operation, maintenance and administration	1,014	966
Fuel used for electric generation	933	968
Water rentals (note 2)	91	87
Power purchased	128	163
Nuclear agreement—payback (note 3)	(63)	(75)
Depreciation (note 4)	705	655
	<u>2,808</u>	<u>2,764</u>
Income before financing charges	<u>2,045</u>	<u>1,861</u>
Interest (note 5)	1,585	1,325
Foreign exchange (note 6)	213	176
	<u>1,798</u>	<u>1,501</u>
Net income	<u>247</u>	<u>360</u>
Appropriation for (withdrawal from):		
Debt retirement	292	252
Stabilization of rates and contingencies	(45)	108
	<u>247</u>	<u>360</u>

See accompanying summary of significant accounting policies and notes to financial statements.



Ontario Hydro
Statement of Financial Position

as at December 31, 1986

	1986	1985
Assets		millions of dollars
Fixed assets (note 7)		
Fixed assets in service	23,312	20,604
Less accumulated depreciation	4,946	4,614
	18,366	15,990
Construction in progress	7,737	8,159
	26,103	24,149
Current assets		
Cash and temporary investments	285	18
Accounts receivable	543	550
Fuel for electric generation (note 8)	1,065	1,015
Materials and supplies, at cost	281	215
	2,174	1,798
Other assets		
Unamortized debt costs	1,597	1,897
Unamortized advances for fuel supplies (note 9)	884	899
Unamortized deferred costs (note 10)	283	313
Long-term accounts receivable and other assets	316	264
	3,080	3,373
	31,357	29,320

See accompanying summary of significant accounting policies and notes to financial statements.

	1986	1985
Liabilities	millions of dollars	
Long-term debt (note 11)	23,494	22,518
Current liabilities		
Accounts payable and accrued charges	473	549
Short-term notes payable	255	223
Accrued interest	742	710
Long-term debt payable within one year	1,076	407
	2,546	1,889
Other liabilities		
Long-term accounts payable and accrued charges	136	158
Accrued irradiated fuel disposal and fixed asset removal costs (note 12)	490	311
	626	469
Contingencies (notes 3, 9, 13 and 15)		
Equity		
Equities accumulated through debt retirement appropriations	2,910	2,618
Reserve for stabilization of rates and contingencies	1,654	1,699
Contributions from the Province of Ontario as assistance for rural construction	127	127
	4,691	4,444
	31,357	29,320

On behalf of the Board

Tom Campbell.

Chairman

Le Franklin

President

Toronto, Canada,
March 9, 1987.



Ontario Hydro
Statement of Equities Accumulated Through
Debt Retirement Appropriations

for the year ended December 31, 1986

	Municipal Utilities	Power District (Rural Retail and Direct Industrial Customers)	Totals	
			1986	1985
millions of dollars				
Balances at beginning of year	1,827	791	2,618	2,366
Appropriation	200	92	292	252
Balances at end of year	2,027	883	2,910	2,618

Statement of Reserve for Stabilization of Rates and Contingencies

for the year ended December 31, 1986

	Held for the benefit of all customers	Held for the benefit of (or recoverable from) certain groups of customers	Totals		
			Municipal Utilities	Rural Retail Customers	Direct Industrial Customers
			1986	1985	
millions of dollars					
Balances at beginning of year	1,742	1	(39)	(5)	1,699 1,591
Appropriation (withdrawal)	(38)	—	(2)	(5)	(45) 108
Balances at end of year	1,704	1	(41)	(10)	1,654 1,699

See accompanying summary of significant accounting policies and notes to financial statements.

Ontario Hydro
Statement of Source of Cash
Used for Investment in Fixed Assets

for the year ended December 31, 1986



	1986	1985
millions of dollars		
Operating activities		
Cash provided from operations (note 14)	1,040	1,055
Financing activities		
Long-term debt issued	2,384	1,781
Less retirements	674	1,024
Cash provided from financing	1,710	757
Investing activities in other assets – decrease (note 14)	70	18
Cash from operating, financing and other investing activities	2,820	1,830
Changes in cash and cash equivalents –(increase) decrease (note 14)	(235)	814
Cash used for investment in fixed assets	2,585	2,644
Changes in accounts payable and accrued charges affecting investment in fixed assets –(decrease)	(62)	(103)
Investment in fixed assets (note 14)	2,523	2,541

See accompanying summary of significant accounting policies and notes to financial statements.



Ontario Hydro Notes to Financial Statements

1. Secondary power and energy

Secondary power and energy revenues include \$247 million (1985-\$350 million) from sales of electricity to United States utilities.

2. Water rentals

Water rentals are the amounts paid primarily to the Province of Ontario for the use of water for hydraulic generation.

3. Nuclear agreement—payback

During 1983, units 1 and 2 of the Pickering Nuclear Generating Station were shut down for replacement of pressure tubes and have not operated since then. The Nuclear Agreement, which is described in the Summary of Significant Accounting Policies, allows maintenance and overhead costs during the shutdown period to be included in payback calculations. The calculations have resulted in negative payback amounts of \$8 million in 1983, \$36 million in 1984, \$75 million in 1985 and \$63 million in 1986. These amounts, totalling \$182 million, have been credited against the costs of operations for the respective years and are included in "long-term accounts receivable and other assets". The basis for this accounting treatment is the belief by Ontario Hydro that under the Nuclear Agreement, these amounts, termed "negative payback", plus interest, can be offset against future positive payback amounts payable to the Province of Ontario and to Atomic Energy of Canada Limited when the units return to service. Atomic Energy of Canada Limited objected to this interpretation and took the position that "negative payback" is not to be offset against future positive payback amounts. In addition, during 1983, the parties to the Nuclear Agreement agreed that the provisions for irradiated fuel disposal costs related to Pickering Nuclear Generating Station units 1 and 2 be included, subject to further discussions, in the calculation of payback for the years 1982, 1983 and 1984, and also to discuss whether such costs should continue to be included in the calculation of payback subsequent to 1984.

During 1986, the parties to the Nuclear Agreement reached a settlement in principle regarding the interpretation of the agreement. The settlement establishes that the negative payback amounts accumulated during the shutdown period of the units, and included as long-term accounts receivable, are recoverable by Ontario Hydro. These amounts, plus interest, are to be recovered by Ontario Hydro over the remaining term of the Nuclear Agreement and will commence when the units are returned to service, which is expected in 1987. The settlement also provides that the termination date of the Nuclear Agreement be extended from the year 2001 to 2003. In addition, the settlement recognizes that the provisions for irradiated fuel disposal costs related to units 1 and 2 are properly allowable costs to be included in the calculation of payback. At this time, the amendment to the Nuclear Agreement to reflect the settlement in principle has not been finalized.

4. Depreciation

	1986	1985
millions of dollars		
Depreciation of fixed assets in service	638	594
Amortization of deferred costs	41	39
Provision for net removal costs	106	104
Other removal costs	15	10
	<u>800</u>	<u>747</u>
Less:		
Depreciation charged to—heavy water production	51	50
—construction in progress	33	27
—fuel for electric generation	2	2
Net gain on sales of fixed assets	9	13
	<u>95</u>	<u>92</u>
	<u>705</u>	<u>655</u>



5. Interest	1986	1985	
	millions of dollars		
Interest on bonds, notes, and other debt	2,650	2,523	
Interest on accrued irradiated fuel disposal and fixed asset removal costs	34	28	
	<u>2,684</u>	<u>2,551</u>	
Less:			
Interest charged to—construction in progress	807	933	
—heavy water production	112	116	
—fuel for electric generation	102	102	
—unamortized advances for fuel supplies	17	15	
Interest earned on investments	61	60	
	<u>1,099</u>	<u>1,226</u>	
	<u>1,585</u>	<u>1,325</u>	
6. Foreign exchange	1986	1985	
	millions of dollars		
Amortization of foreign exchange gains and losses	189	190	
Net exchange loss (gain) on other foreign transactions	24	(14)	
	<u>213</u>	<u>176</u>	
7. Fixed assets	1986		
	Assets in Service	Accumulated Depreciation	Construction in Progress
	millions of dollars		
Generating stations—hydraulic	1,844	572	26
—fossil	2,825	784	24
—nuclear	8,823	942	6,188
Heavy water	2,117	171	997
Transmission and distribution	4,748	1,283	425
Heavy water production facilities	1,128	339	—
Administration and service facilities	1,042	407	77
Non-operating reserve facilities			
—fossil generating stations	785	448	—
	<u>23,312</u>	<u>4,946</u>	<u>7,737</u>
	1985		
	Assets in Service	Accumulated Depreciation	Construction in Progress
	millions of dollars		
Generating stations—hydraulic	1,830	544	11
—fossil	2,836	697	32
—nuclear	6,805	718	6,561
Heavy water	1,605	136	1,187
Transmission and distribution	4,462	1,182	304
Heavy water production facilities	1,128	285	—
Administration and service facilities	915	383	64
Non-operating reserve facilities			
—fossil generating stations	786	432	—
—heavy water production facilities	237	237	—
	<u>20,604</u>	<u>4,614</u>	<u>8,159</u>



7. Fixed assets (continued)

Non-operating reserve facilities consist of Lennox, R.L. Hearn, J.C. Keith and Thunder Bay unit 1 fossil generating stations. Substantially all of the undepreciated cost of non-operating reserve facilities is related to Lennox generating station, which based on current forecasts, is expected to return to operations in the mid 1990s. Based on current forecasts, Bruce Heavy Water Plant "A" has been declared surplus and, accordingly, the capital cost and accumulated depreciation related to this facility were reduced by \$237 million effective December 31, 1986.

Construction in progress at December 31, 1986:

	Remaining Number of Planned Units	In-Service Scheduled Dates	Dependable Capacity to be Placed in Service	Costs Incurred to December 31, 1986	Estimated Costs (Excluding Escalation and Interest)
				megawatts	millions of dollars
Nuclear generating stations (including heavy water)					
Bruce "B"	1	1987	835	1,497	81
Darlington	4	1988-92	3,524	5,187	2,665
All other construction in progress	—	—	—	1,053	—
				7,737	

Estimated costs to complete are the most recent projections. These estimates exclude cost escalation and interest which are forecast to average 6% and 11% per year, respectively, over the period 1987 to 1992. Because of the uncertainties associated with long construction lead times and planned in-service dates, these costs to complete are subject to change.

The fuel channel replacement program for Pickering "A" units 1 and 2 is estimated to cost \$439 million, excluding interest and escalation. Of this total, \$304 million is to be capitalized as installation costs, and the remaining \$135 million is related to the removal costs of the existing pressure tubes and is being recovered through charges to operations as described in note 12. The actual expenditures for installation costs, including interest of \$56 million, totalled \$247 million as of December 31, 1986 and are included in all other construction in progress in the above table. The first two units of Pickering "A" are expected to be returned to service in 1987.

For 1987, additional investment in fixed assets is estimated to be approximately \$2,532 million including escalation and interest.

8. Fuel for electric generation

	1986	1985
	millions of dollars	
Inventories – uranium		
– coal	586	533
	479	482
	1,065	1,015



9. Unamortized advances for fuel supplies	1986	1985
millions of dollars		
Uranium—Rio Algom Limited	431	450
—Denison Mines Limited	359	355
	790	805
Coal	94	94
	884	899

Unamortized advances for fuel supplies are recovered as fuel is delivered. Contractual obligations for additional advance payments for uranium supplies together with interest capitalization approximately equal the amortization of advances for uranium supplies over the next five years.

Ontario Hydro has entered into long-term contracts with Denison Mines Limited and Rio Algom Limited for uranium supplies through to 2012 and 2027, respectively. Ontario Hydro's current forecast of the annual requirements for uranium is approximately 1,300 megagrams for 1987, increasing to approximately 1,900 megagrams by 1994. The forecasted requirements and contracted deliveries are in balance up to 1994. Commencing in 1994 through to 2012, contracted deliveries exceed requirements of the nuclear generating facilities currently in service and under construction by approximately 1,000 megagrams per year. Ontario Hydro's options for managing the oversupply include resale of the uranium and, under specified conditions, cancellation or renegotiation of the contracts. In the event that a contract is cancelled, the supplier is not required to refund any outstanding advances. At this time, the likelihood of a contract cancellation and the financial implications of pursuing the options are not determinable.

10. Unamortized deferred costs	1986	1985
millions of dollars		
Bruce Heavy Water Plant "D"	259	280
Wesleyville Generating Station	24	33
	283	313

Bruce Heavy Water Plant "D" is an indefinitely deferred project with a low probability of construction being resumed. The capital cost of this project and the unamortized deferred costs associated with the cancelled Wesleyville generating station project were not written off directly to operations since the Board of Directors under its rate setting authority determined that these costs be amortized for recovery through electricity rates over the period 1984 through 1993. As a result of a recent review, the costs of removal of Bruce Heavy Water Plant "D" have been estimated to be \$18 million and, accordingly, this amount was included as an adjustment to the cost of this project, effective January 1, 1986. The amortization of the deferred costs associated with these projects results in an annual charge of \$41 million for 1986.

11. Long-term debt	1986	1985
millions of dollars		
Bonds and notes payable	24,390	22,728
Other long-term debt	180	197
	24,570	22,925
Less payable within one year	1,076	407
	23,494	22,518

Bonds and notes payable:

Bonds and notes payable, expressed in Canadian dollars, are summarized by years of maturity and by the currency in which they are payable in the following table:



11. Long-term debt (continued)

Years of Maturity	1986			1985		
	Principal Outstanding		Weighted Average Coupon Rate	Principal Outstanding		Weighted Average Coupon Rate
	Canadian	Foreign		Total	per cent	
millions of dollars						
1986	—	—	—	—	386	
1987	738	316	1,054	—	1,039	
1988	853	336	1,189	—	1,191	
1989	517	818	1,335	—	1,347	
1990	1,030	740	1,770	—	1,756	
1991	1,148	942	2,090	—	—	
1- 5 years	4,286	3,152	7,438	11.7	5,719	11.5
6-10 years	3,400	2,069	5,469	10.8	5,026	12.8
11-15 years	2,389	646	3,035	10.9	2,473	9.5
16-20 years	2,058	1,296	3,354	10.5	4,096	11.2
21-25 years	1,793	2,663	4,456	11.0	4,005	10.5
26-30 years	—	638	638	14.4	1,409	14.8
	13,926	10,464	24,390	11.2	22,728	11.5
Currency in which payable:						
Canadian dollars			13,926		11,839	
United States dollars			10,355		10,699	
Swiss francs			86		122	
West German Deutsche marks			—		41	
United Kingdom pounds sterling			23		27	
			24,390		22,728	

Ontario Hydro has entered into financial arrangements to hedge a portion of the foreign currency exposure related to principal and interest payments with respect to long-term debt. As at December 31, 1986, these arrangements amounted to United States \$744 million and Swiss francs 106 million, having weighted average Canadian dollar exchange rates of 1.39 and 0.87 respectively. These arrangements are primarily in short-term forward exchange contracts which hedge principal and interest payments due in 1987.

Bonds and notes payable in United States dollars include Canadian \$7,083 million (1985 - Canadian \$7,190 million) of Ontario Hydro bonds held by the Province of Ontario and having terms identical with Province of Ontario issues sold in the United States on behalf of Ontario Hydro. Bonds and notes payable are either held, or guaranteed as to principal and interest, by the Province of Ontario.

Ontario Hydro has entered into interest rate swap arrangements amounting to Canadian \$350 million in notional principal as at December 31, 1986, and expiring in 1989 through 1993. These arrangements have effectively converted fixed interest rates on long-term debt, having a weighted average coupon rate of 9.82%, to variable interest rates which are adjusted quarterly to the prevailing Canadian bankers' acceptance rate.

Other long-term debt:

	Years of Maturity	Interest Rate	1986	1985
			per cent	millions of dollars
Balance due to Atomic Energy of Canada Limited on purchase of Bruce Heavy Water Plant "A"	1992	7.8	121	137
Capitalized lease obligation for the Head Office building, payable in U.S. dollars	2005	8.0	52	53
Capitalized lease obligations for transport and service equipment	1987 to 1994	6.3 to 11.9	7	7
			180	197

11. Long-term debt (continued)

Payments required on the above debt, excluding interest, will total \$111 million over the next five years. The amount payable within one year is \$22 million (1985-\$21 million).

12. Accrued irradiated fuel disposal and fixed asset removal costs

	1986	1985
	millions of dollars	
Accrued irradiated fuel disposal costs	243	189
Accrued fixed asset removal costs	247	122
	490	311

Irradiated fuel disposal costs:

The significant assumptions used in estimating the future irradiated fuel disposal costs were:

- an in-service date of the year 2010 for irradiated nuclear fuel disposal facilities;
- a transportation distance of 1,000 kilometres from nuclear generating facilities to disposal facilities;
- interest rates through to the disposal date ranging from 9% to 12% (1985–10% to 15%); and
- escalation rates through to the disposal date ranging from 5% to 9% (1985–5% to 12%).

Because of the uncertainties associated with the technology of disposal, and the above factors, these costs are subject to change.

Fixed asset removal costs:

Fixed asset removal costs are the costs of decommissioning nuclear generating stations and heavy water production facilities after the end of their service lives, and the costs of removing certain fuel channels from nuclear reactors which are expected to be replaced during the life of the reactors. The significant assumptions used in estimating fixed asset removal costs were:

- decommissioning of nuclear generating stations in the 2041 to 2062 period on the deferred dismantlement basis (dismantlement following storage with surveillance for a 30-year period after shutdown of the reactors), and a transportation distance of 1,000 kilometres from nuclear generating facilities to disposal facilities;
- dismantlement of Bruce Heavy Water Plants "A", "B" and "D" in the 1991 to 2005 period;
- removal of fuel channels in Pickering Nuclear Generating Station "A" units 1 and 2 in the 1984 to 1987 period and units 3 and 4 in the 2000 to 2003 period, and Bruce Nuclear Generating Station "A" in the 2002 to 2010 (1985-2002 to 2007) period, and commencing in 1986, Pickering "B" in the 2012 to 2018 period and Bruce "B" in the 2013 to 2019 period;
- interest rates through to 2062 ranging from 9% to 12% (1985–10% to 15%); and
- escalation rates through to 2062 ranging from 5% to 8% (1985–5% to 12%).

Because of the uncertainties associated with the technology of decommissioning and fuel channel removal, and the above factors, these costs are subject to change.

The fuel channel removal costs for Pickering "A" units 1 and 2 are being recovered by way of annual provision through to 1987 when both units are expected to return to service. As of December 31, 1986, annual provisions totalled \$124 million with actual expenditures incurred amounting to \$114 million.

13. Fuel oil contract

Ontario Hydro contracted with Petrosar Limited for the purchase of 20,000 barrels of residual fuel oil per day through to April 1992. Deliveries for the years 1981 and 1982 were 6% and 2%, respectively, of the contract quantities and no deliveries were taken since then. Amounts have been charged to the costs of operations in prior years to provide for settlement with respect to reduced deliveries up to and including 1982. Ontario Hydro advised Petrosar Limited on May 24, 1983 that the contract is at an end due to Petrosar Limited's prior undertaking to the Government of Canada to limit its production of



13. Fuel oil contract (continued)

residual fuel oil to an amount less than the contracted quantities. Petrosar Limited commenced actions claiming damages of \$45.5 million and \$59.9 million for failure to take the contract quantities in 1981 and 1982, respectively. Ontario Hydro counterclaimed for \$39.4 million paid to Petrosar Limited in 1980, 1981 and 1982 and an accounting for the difference between market and contract prices for residual fuel oil supplied since the date of such undertaking. The trial on this matter in the Supreme Court of Ontario ended on March 18, 1986. On April 21, 1986, the Supreme Court rendered its decision that the contract between Ontario Hydro and Petrosar Limited was at an end, and that Petrosar Limited was to return the \$25.5 million previously paid by Ontario Hydro with respect to 1981 and 1982, plus costs and interest. Petrosar Limited has appealed the court's decision. These financial statements do not reflect the effects of the court's decision.

14. Statement of Source of Cash Used for Investment in Fixed Assets

The Statement of Source of Cash Used for Investment in Fixed Assets reports the investment in fixed assets resulting from the cash flows from operating, financing and other investing activities, and the effects of changes in cash and cash equivalents and changes in accounts payable and accrued charges affecting investment in fixed assets during the year. This statement focuses on the investment in fixed assets in view of Ontario Hydro's current level of construction activities which are financed from two major sources, cash provided from operations and cash from external borrowings.

The components of cash provided from operations, investment in other assets, and changes in cash and cash equivalents, defined to be cash and temporary investments net of short-term notes payable, are summarized below.

	1986	1985
	millions of dollars	
Net income	247	360
Items not requiring cash in the current year		
Depreciation	705	655
Amortization of foreign exchange gains and losses	189	190
Provision for irradiated fuel disposal costs	35	24
Nuclear agreement—payback	(63)	(75)
Other	16	21
Funds provided from operations	1,129	1,175
Changes in working capital, excluding cash and cash equivalents, and long-term accounts payable affecting operations—(increase)	(89)	(120)
Cash provided from operations	1,040	1,055
Investment in other assets:		
Advances and related costs for fuel supplies	1986	1985
Less repayments and amortization of advances for fuel supplies	(32)	(37)
Other	49	39
Investment in other assets—decrease	70	18
Changes in cash and cash equivalents:		
Cash and temporary investments— (increase) decrease	1986	1985
Short-term notes payable—increase	(267)	640
Changes in cash and cash equivalents— (increase) decrease	(235)	814



14. Statement of Source of Cash Used for Investment in Fixed Assets

(continued)

The reconciliation of the change in fixed assets during the year with the investment in fixed assets for the year is summarized below.

	1986	1985
	millions of dollars	
Change in fixed assets	1,954	2,002
Depreciation of fixed assets in service	638	594
Less depreciation charged to heavy water production and construction in progress	(84)	(77)
	554	517
Net book value of fixed assets sold or retired	15	22
Investment in fixed assets	2,523	2,541

15. Pension and Insurance Plans

Ontario Hydro's employee benefit programs include pension and insurance plans. The assets of the pension, group life insurance and long-term disability plans and the changes in assets during the year are shown in the financial statements of The Pension and Insurance Fund, and are not included in Ontario Hydro's financial statements.

Pension Plan:

The most recent actuarial valuation of Ontario Hydro's pension plan as at December 31, 1985 reported a surplus of approximately \$399 million (December 31, 1984—\$220 million). The increase in the pension plan surplus during 1985 is attributable to an experience surplus of \$194 million and a surplus of \$87 million arising from changes in actuarial methodology, partially offset by an application of \$42 million towards plan improvements on January 1, 1985, and the amortization of \$60 million of the established surplus. In 1986, \$59 million of the \$399 million surplus was applied towards plan improvements to the pension plan.

The significant actuarial assumptions used in the 1985 and 1984 valuations were:

- rate used to discount future investment income—8.5%, and future benefits—8%;
- salary escalation rate—8%;
- average retirement age for males—60.7 (1984—60.3) and for females—61.0 (1984—61.2); and
- corporate shares valuation—five-year market value average.

The pension plan costs for 1986 were nil (1985—\$21 million) after the application of \$74 million (1985—\$58 million) of pension plan surplus to meet Ontario Hydro's current service cost for 1986.

On October 21, 1986, the Ontario Hydro Employees Union, Local 1000 of the Canadian Union of Public Employees—C.L.C. filed an application for judicial review in the Supreme Court of Ontario to determine whether Ontario Hydro is entitled to apply the pension surplus that has accumulated in Ontario Hydro's pension plan to meet the Corporation's contribution with respect to current service cost. The hearing on this matter was held on February 5, 1987. On March 3, 1987, the Supreme Court rendered its decision that Ontario Hydro has complied with the relevant statutory provisions regarding the corporate contribution towards current service cost. The Ontario Hydro Employees Union has the right to seek leave to appeal the court's decision.

Group Life Insurance Plan:

The group life insurance plan had a surplus of approximately \$33 million as of December 31, 1986 (December 31, 1985—\$34 million). Effective April 1, 1986, this surplus will be used to pay the insurance premiums for all members of the plan until the surplus is fully utilized.

16. Research and development

In 1986, approximately \$71 million of research and development costs were charged to operations and \$21 million were capitalized (1985—\$63 million and \$17 million, respectively).



Ontario Hydro
Five-Year Summary of
Financial Statistics

	1986	1985	1984	1983	1982
millions of dollars					
Revenues					
Primary power and energy					
Municipal utilities	3,116	2,891	2,555	2,265	1,997
Rural retail customers	885	815	712	644	576
Direct industrial customers	604	568	516	448	395
	4,605	4,274	3,783	3,357	2,968
Secondary power and energy	248	351	429	448	419
	4,853	4,625	4,212	3,805	3,387
Costs					
Operation, maintenance and administration	1,014	966	884	952	854
Fuel and fuel related	1,089	1,143	1,210	1,169	1,094
Depreciation	705	655	476	396	348
	2,808	2,764	2,570	2,517	2,296
Income before financing charges					
	2,045	1,861	1,642	1,288	1,091
Financing charges					
Gross interest	2,684	2,551	2,322	2,012	1,708
Capitalized interest	(1,038)	(1,166)	(1,293)	(1,194)	(968)
Investment income	(61)	(60)	(80)	(58)	(67)
Foreign exchange	213	176	118	56	70
	1,798	1,501	1,067	816	743
Net income					
	247	360	575	472	348
Financial position					
Total assets	31,357	29,320	27,301	23,194	20,721
Fixed assets	26,103	24,149	22,147	19,948	17,600
Long-term debt	23,494	22,518	20,659	17,977	15,882
Equity	4,691	4,444	4,084	3,509	3,037
Source and use of cash					
Cash from operations	1,040	1,055	1,088	950	686
Cash from financing	1,710	757	1,756	1,823	2,172
Cash used for investment					
in fixed assets	2,585	2,644	2,539	2,668	2,690
Investment in fixed assets	2,523	2,541	2,624	2,746	2,885
Financial indicators					
Debt ratio ⁽¹⁾	.835	.830	.833	.840	.845
Cash flow coverage ⁽²⁾	1.05	1.02	.96	.88	.89
Interest coverage ⁽³⁾	1.09	1.14	1.25	1.24	1.20



	1986	1985	1984	1983	1982
in cents per kilowatt-hour of total energy sales					
Average revenue⁽⁴⁾					
Primary power and energy					
Municipal utilities	3.894	3.754	3.440	3.210	2.981
Rural retail customers	5.909	5.720	5.143	5.027	4.475
Direct industrial customers	3.272	3.155	2.896	2.740	2.614
Secondary power and energy	4.102	4.098	4.037	3.768	3.895
All classifications combined	4.017	3.925	3.586	3.409	3.203
expressed as a per cent					
Average rate increases					
Municipal utilities	4.0	8.5	8.0	8.2	9.6
Rural retail customers	3.8	8.7	7.5	8.8	8.7
Direct industrial customers	4.3	8.8	7.6	8.5	10.0
in cents per kilowatt-hour of energy generated					
Average cost⁽⁴⁾⁽⁵⁾					
Hydraulic					
Operation, maintenance and administration	.200	.187	.184	.159	.173
Fuel-water rentals	.243	.233	.164	.076	.073
Depreciation and financing charges	.414	.399	.384	.345	.360
	.857	.819	.732	.580	.606
Nuclear					
Operation, maintenance and administration	.472	.479	.506	.491	.487
Fuel-uranium	.481	.426	.361	.357	.384
Depreciation and financing charges	2.051	1.889	1.330	1.026	.883
	3.004	2.794	2.197	1.874	1.754
Fossil					
Operation, maintenance and administration	.544	.437	.348	.368	.402
Fuel-coal, gas and oil	2.745	2.609	2.500	2.417	2.328
Depreciation and financing charges	1.444	.997	.597	.586	.683
	4.733	4.043	3.445	3.371	3.413

Footnotes

(1) Debt ratio represents debt (bonds and notes payable, short-term notes payable, other long-term debt, and accrued irradiated fuel disposal and fixed asset removal costs less unamortized foreign exchange gains and losses) divided by debt plus equity.

(2) Cash flow coverage ratio represents funds provided from operations plus net interest, and interest charged to fuel for electric generation less interest on accrued provisions divided by interest on bonds, notes, and other debt.

(3) Interest coverage represents net income plus interest on bonds, notes, and other debt divided by interest on bonds, notes and other debt.

(4) Figures for 1986 are preliminary.

(5) Average cost per kilowatt-hour represents the costs attributable to generation but excludes the costs related to transmission, distribution and corporate administrative activities. These figures reflect the historical accounting costs of operating facilities and the actual energy generated by these facilities during the year.



Ontario Hydro
Comparative Statistics

	1986	1985	1984	1983	1982
in millions of kilowatt-hours					
Customer statistics⁽¹⁾					
Primary energy sales					
Municipal utilities	80,026	77,011	74,283	70,579	67,021
Rural retail	16,279	15,638	14,732	14,006	13,716
Direct industrial	18,458	18,011	17,816	16,345	15,119
	114,763	110,660	106,831	100,930	95,856
Secondary energy sales	6,046	8,565	10,627	11,900	10,753
in thousands					
Total Ontario customers					
Residential	2,774	2,712	2,652	2,604	2,559
Farm	106	107	107	108	110
Commercial and industrial	361	354	346	339	335
	3,241	3,173	3,105	3,051	3,004
in kilowatt-hours per customer					
Average annual use					
Residential	10,700	10,618	10,590	10,149	9,976
Farm	23,004	22,618	22,556	21,389	21,135
Commercial and industrial	215,000	213,673	212,700	200,436	194,376
in cents per kilowatt-hour					
Average revenue					
Residential	5.62	5.42	5.02	4.69	4.34
Farm	6.01	5.74	5.24	4.87	4.50
Commercial and industrial	4.20	4.03	3.74	3.50	3.28
Operating statistics					
Dependable peak capacity ('000 kW) ⁽²⁾	30,701	28,224	26,612	25,269	24,906
December primary peak demand ('000 kW)	20,609	20,473	18,052	18,792	16,872
Primary energy made available ('000,000 kWh)	120,574	116,049	112,293	106,071	100,836
Total staff, average for year (includes regular and temporary staff)	32,405	31,166	29,613	31,233	32,654

Footnotes

(1) Figures for 1986 are preliminary.

(2) Includes mothballed generation: 1986—3,782,700 kW; 1985—3,932,700 kW; 1984—3,999,200 kW; 1983—3,783,200 kW; and 1982—3,034,200 kW.

Board of Directors	Officers	Regional Directors	Committees of the Board of Directors
J.A. Gordon Bell , Thornhill <i>Vice-Chairman, Ontario Hydro;</i> Deputy Chairman, President and Chief Operating Officer, Bank of Nova Scotia	Chairman of the Board Tom Campbell President Robert C. Franklin	Central Region C.G. (Gord) Sanford 5760 Yonge Street Willowdale M2M 3T7	Finance T. Campbell (Chairman) J.A.G. Bell F.T. Cowan J.B. Cronyn R.C. Franklin L.N. Savoie
Tom Campbell , Toronto <i>Chairman, Ontario Hydro</i>	Vice-Chairman J.A. Gordon Bell	Eastern Region D.A. (Don) Watson 420 Dundas Street East Bellefontaine K8N 5C3	Audit J.B. Cronyn (Chairman) I. Harper (Vice-Chairman) T. Campbell R.E. Cavanagh A.B. Cousins F.T. Cowan A.G. Hearn
Richard E. Cavanagh , Scarborough Chairman, Scarborough Public Utilities Commission	Senior Executive Vice-President Patrick G. Campbell (retired September 1, 1986)	Georgian Bay Region F.A. (Al) Pertula 93 Bell Farm Road Barrie L4M 1H1	Management Resources J.A.C. Bell (Chairman) T. Campbell J.B. Cronyn J.W. Erickson O.J.C. Runnalls L.N. Savoie
Alan B. Cousins , Wallaceburg Former President, Ideal Stampings Limited	Executive Vice-Presidents E.H. (Ted) Burdette Finance and Planning	Northeastern Region G.R. (Bud) Barrett 590 Graham Drive North Bay P1B 8L4	Social Responsibility J.W. Erickson (Chairman) T. Campbell R.E. Cavanagh A.B. Cousins F.T. Cowan R.C. Franklin I. Harper A.G. Hearn
F. Tom Cowan , Cold Springs Farmer, Chimo Farms; and Vice-President, Agri-Services Ltd.	Sam G. Horton Human Resources, Engineering and Services	Northwestern Region J.D. (Jack) Hamer (retired October 1, 1986) 34 Cumberland Street North Thunder Bay P7A 4L5	Technical Advisory O.J.C. Runnalls (Chairman) T. Campbell J.W. Erickson R.C. Franklin I. Harper A.J. MacIntosh
John B. Cronyn , London Director, John Labatt Limited	Arvo Niitenberg Operations	R.H. (Ron) Stewart (from October 1, 1986)	
A. Ephraim Diamond , Toronto <i>Deputy Vice-Chairman, Ontario Hydro;</i> President, Whitecastle Investments Limited (retired April 30, 1986)	Vice-Presidents R.W. (Ron) Bartholomew Production	Western Region Dr. David A. Drinkwater 1075 Wellington Road London N6E 1M1	
John W. Erickson , Q.C. Thunder Bay Barrister and Solicitor	C.S. (Cliff) Elliott Human Resources (retired December 31, 1986)		
Robert C. Franklin , Toronto <i>President, Ontario Hydro</i>	D.B. (Dane) MacCarthy Marketing		
Isobel Harper , Toronto Vice-President, W.H. Harper Inc.	J.G. (John) Matthew Supply and Services		
Albert G. Hearn , Agincourt Former Canadian Vice-President, Service Employees International Union	L.G. (Lorne) McConnell Power System Program		
A.J. MacIntosh , Q.C., Toronto Blake, Cassels, & Graydon Barristers & Solicitors	W.G. (William) Morison Design and Construction		
Dr. O. John C. Runnalls , Toronto Chairman, Centre for Nuclear Engineering, and Professor of Energy Studies, University of Toronto	J.R. (John) O'Connor Acting Vice-President Corporate Relations (from June 1, 1986)		
Leonard N. Savoie , Sault Ste. Marie, President and Chief Executive Officer, Algoma Central Railway	J.B. (Jim) Smith Corporate Relations (retired June 1, 1986)		
	H.K. (Hal) Wright Regions		
	General Counsel and Secretary L.E. (Larry) Leonoff		
	Treasurer Dirk Peper		
	Corporate Comptroller Ian R. Russell		

Credits

Design:
The Abbott Jenkins Design Group, Toronto, Ontario
Typesetting:
Cooper & Beatty Limited, Toronto, Ontario
Colour Separations:
Empress Litho Plate Ltd., Scarborough, Ontario
Printing:
Matthews, Ingham and Lake Inc., Don Mills, Ontario

Ce rapport est également publié en français.



Ontario Hydro

CAZON
EP
A55
exp. 2

Philip



ONTARIO HYDRO

ANNUAL REPORT 1987

ONTARIO HYDRO'S
BOARD OF DIRECTORS' REPORT FOR 1987

To:

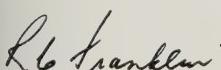
The Honourable Robert Wong
Minister of Energy

1

Ontario Hydro's Board of
Directors submits to you this
report of the financial position
and relevant Ontario Hydro
activities for the year 1987.

We thank you and Ministry of
Energy staff for the cooperation
extended during the year.

On behalf of the Board,



Robert Franklin

Chairman and President

April, 1988

Ontario Hydro's prime objective is to supply the people of Ontario with electricity at cost while maintaining high standards of safety and service. To that end, it operates 80 hydraulic, fossil and nuclear generating stations and an extensive power grid across Ontario to meet the province's demands for electric energy.

Ontario Hydro is a financially self-sustaining corporation without share capital created in 1906 by a special statute of the Province of Ontario. Bonds and notes issued to the public by the Corporation are guaranteed by the province.

Under the authority of the Power Corporation Act, Ontario Hydro has broad powers to generate, supply and deliver electricity throughout the province. It is also authorized to produce and sell steam and hot water as primary products. In addition, Ontario Hydro exercises specific regulatory functions over municipal utilities as well as the approval and

inspection functions for electrical equipment (in conjunction with the Canadian Standards Association) and electrical wiring installations throughout the province.

Ontario Hydro sells wholesale electric power to municipal utilities in urban areas which, in turn, retail to customers in their service areas. Ontario Hydro also serves directly more than 100 large industrial customers and 835,925 rural retail customers in areas or communities not served by municipal utilities. In 1987, approximately 3,344,000 customers were served by Ontario Hydro and the municipal utilities in the province.

The business and affairs of Ontario Hydro are directed and controlled by a board of directors made up of a chairman, vice-chairman, a president, and not more than 10 other directors. All members of the Board, who represent a broad spectrum of Ontario society, are appointed by the Lieutenant Governor in Council of the province except the president

who is a full-time employee of the Corporation appointed by the Board.

To assist the Board in directing the Corporation's affairs there are five Committees of the Board: Finance, Audit, Management Resources, Social Responsibility, and Technical Advisory. In 1987, a new committee was formed to advise the Ontario Hydro Board members about northern affairs. Six individuals from northern Ontario, none of whom are members of the Board, were appointed by the provincial government to the Northern Ontario Hydro Advisory Committee. All the committees review and make recommendations to the Board on matters within their terms of reference.

Ontario Hydro's head office is located at 700 University Avenue, Toronto, Ontario. For administrative and operational purposes, six regional and 47 area offices are maintained throughout the province.

FINANCIAL HIGHLIGHTS

	1987	1986
	<i>millions of dollars</i>	
Revenues	5,280	4,853
Net Income	271	247
Total Assets	32,657	31,357
Investment in Fixed Assets	2,524	2,523

**SECURING TOMORROW TODAY:
ONTARIO HYDRO AND THE ENVIRONMENT**

*The people of Ontario Hydro share
a commitment to manage the
environmental effects of generating
and delivering electricity without
compromising the well-being of
this province.*



4

Our society's concern for the environment is an explicit recognition that what we do today has a direct effect on tomorrow. It is a concern shared by all the people of Ontario, for we all benefit from the natural wealth of our province and the bright future it promises.

Almost anything humans do affects the natural environment to some degree. But that must be balanced against the contributions technology makes to our lives. As well, if technology is a source of environmental problems, technology—and the human expertise which develops it—may also be our best source of solutions.

By the very nature of our business, Ontario Hydro affects the environment, both natural and social. The effects vary, depending on the size and

type of operation. But the fact remains, we create environmental problems.

At the same time, Ontario Hydro provides a product that has come to be an essential element of our lives. Our broad objective as a corporation, then, must be to obtain the maximum benefit from our technology with the minimum impact on the natural world.

Because we operate in virtually every corner of the province, we address a broad range of environmental issues, from the handling of PCBs to the flooding of land as a result of hydraulic projects. At Ontario Hydro, therefore, responsibility for mitigating environmental effects cuts across almost every area of the organization. Highly skilled specialists—biologists, chemists, physicists and engineers—work full-time to identify potential environmental

hazards and to find solutions or methods of control.

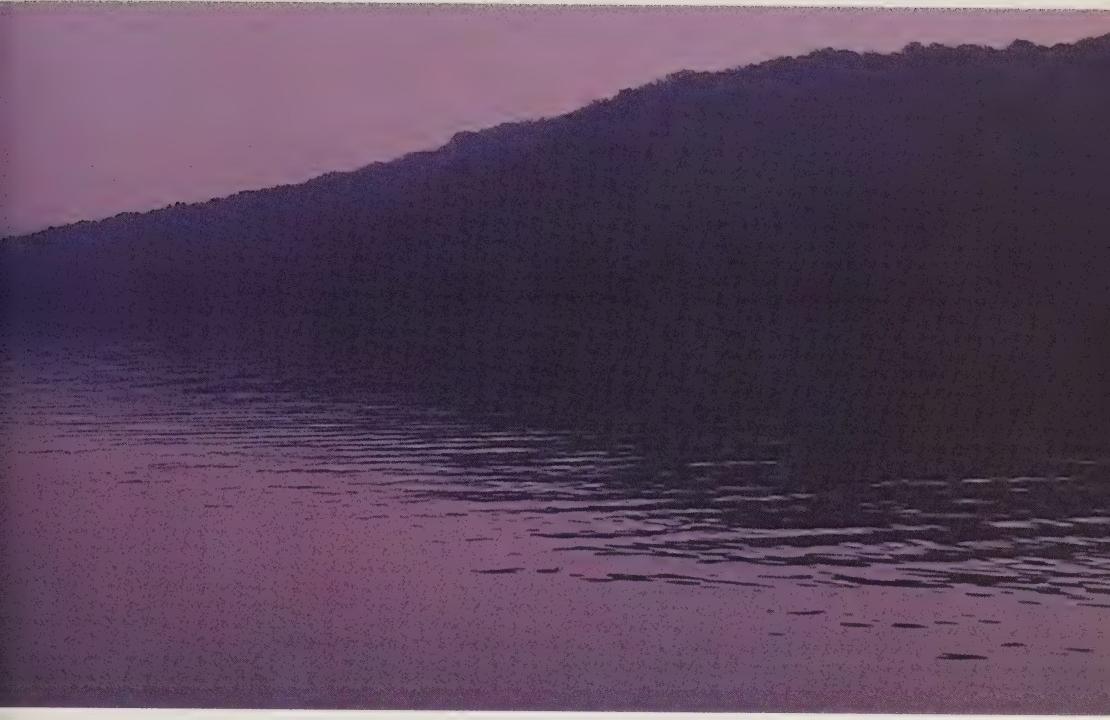
The problems these specialists address include everything from concern for nesting birds to design contingencies in nuclear reactors. But large or small, the problem commands the same high degree of commitment.

Two major issues cause most public concern: the safety of nuclear operations and acid gas emissions from fossil-fuel stations. But many other environmental concerns also stake a claim to our attention. Our objective in each case is to use each dollar wisely to find the best solutions. Thus, Ontario Hydro initiatives, from the day the concepts are proposed, must pass tests for environmental and social acceptability, safety, reliability and economic soundness.

In nuclear operations, for instance, Ontario Hydro is among the world leaders in generation performance and

safety. In more than 20 years, radioactive emissions have never exceeded Atomic Energy Control Board limits. No member of the public has ever been harmed. This record is a result of the built-in design features of Ontario Hydro's CANDU reactors, an exacting nuclear operator training program, and rigorously tested and monitored transportation and storage facilities.

We continue to work closely with Atomic Energy of Canada Limited (AECL) to find a preferred method of nuclear waste disposal. In 1987, for example, we committed about \$25 million to fund the AECL research program, much of which is focussed on the disposal issue. That financial support was almost three times the level committed in 1986 and, in 1988, we expect the funding to be about \$35 million.



This work is continuing even though the current short term method of storing used fuel bundles in water-filled pools at each nuclear station has proven safe, reliable and able to meet the needs well into the next century.

In other areas of electricity production, some of our technology is older than recent understanding of the problem. Knowledge of the impact of acid rain, for example, has grown rapidly over the last dozen years. Yet Lakeview Thermal Generating Station was designed in the 1950s and our other coal-fired stations in the 1960s.

This has left Ontario Hydro with some catching up to do, and we have initiated corrective action. Since 1982, Ontario Hydro has reduced its acid gas emissions by 25.8 per cent. At the same time, it has met a power demand that has

increased by 20.3 per cent and held rate increases to some of the lowest levels in years.

This has not been easy. In 1987, Ontario Hydro burned 49 per cent more coal than forecast, largely because dry weather reduced the amount of water available for hydraulic generation. As a result, our emissions, although still below regulated limits, were 25 per cent higher than in 1986.

There are a number of programs we have initiated to find the best long term solutions. Modifying burners, washing and blending coal, and burning low-sulphur western Canadian coal all help reduce emissions. We continue to conduct research aimed at minimizing acid gas emissions at the combustion stage. In the next three years, Ontario Hydro has earmarked \$7.7 million for those

efforts which focus on four types of flue-gas desulphurization to reduce sulphur dioxide emissions. Testing on one process, in which limestone is injected directly into the steam generator's furnaces, is continuing at Lakeview Generating Station.

Another promising environmental effort is Ontario Hydro's promotion of energy efficiency and load shifting. Successful programs in these areas can reduce the need for new supply, minimizing the adverse effects of electricity generation on the environment.

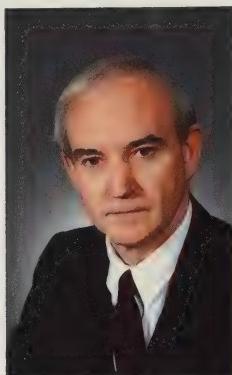
With energy efficiency programs and financial incentives, Ontario Hydro expects to be able to slow significantly the growth in demand by the year 2000.

As well, for certain applications, electricity is cleaner and more efficient than oil and gas.

In those instances, it makes environmental and economic sense to promote the substitution of electricity.

Careful management of the impact of any industry on the environment requires a multifaceted approach that begins with corporate commitment. Ontario Hydro has assigned hundreds of people and millions of dollars to minimize its impact on the environment even as the Corporation has met the province's power needs with fiscal responsibility. It is a continuing commitment.

Meeting the public's expectations for a healthy environment is an intrinsic part of the core business of Ontario Hydro. For our business is to serve, to help make sure Ontario remains a great place to live.



The world is much changed in the eight decades since Sir Adam Beck and his colleagues initiated what is now Ontario Hydro. It is clear that electricity has been a major contributor to that change.

A low-cost, reliable supply of electricity has provided an economic underpinning for the continued growth of this province. As a result, it has played a major role in enhancing the quality of life in Ontario.

We are producing and using electricity today in ways never dreamed of in Sir Adam's time.

But even as technological advances have changed our world, they have brought with them new attitudes. For example, as our knowledge grows about the effects of industry on the environment, so does our duty to mitigate that impact.

We are proud of Ontario Hydro's record of environmental sensitivity, and this year's annual report highlights some

of our activities. We have always worked to produce electricity economically, reliably, safely and in a socially responsible and acceptable manner.

However, with new knowledge comes the opportunity and responsibility to continue to improve.

The province's economic growth will increase pressure on Ontario Hydro's ability to meet demand even as we work to protect the environment. Since the recession earlier this decade, the demand for electricity has exceeded Ontario Hydro's most likely forecasts. In 1986, demand rose by 3.9 per cent; this year by 4.9 per cent. On average, the demand for electrical energy has grown each year by an amount equal to the needs of a city the size of Hamilton.

We expect to be able to meet that growth into the mid-1990s with the existing system, plus energy efficiency programs, and generation and transmission facilities now approved and under construction.

In December, Ontario Hydro released to the Minister of Energy its Demand/Supply Planning Strategy, a comprehensive review of all options for meeting electricity needs beyond the 1990s. The study will provide a framework for extensive public and government review, leading to a final strategy.

Inherent in this process is the recognition that any decisions Ontario Hydro and the people of the province make together must not put the environment at risk. It is crucial to our quality of life, and to that of our children, grandchildren and beyond.

It has been a privilege to be chairman of Ontario Hydro. I would like to thank the Board of Directors, all Ontario Hydro employees and the municipal utilities for all their help.

Inevitably, any man-made installation has an impact on the environment. For Ontario Hydro, whose operations span the province, that fact is at the root of a corporate commitment to minimize the effect of our operations on Ontario's natural heritage.

Meeting that commitment is never easy. As a business Ontario Hydro must also address our two other fundamental goals: to supply reliable power and to do it at low cost.

There is no doubt that Ontario Hydro is part of the problem: our operations do affect the environment. But we have the resources and the will-power to offer solutions as well.

In our earliest planning, we work to anticipate and minimize environmental impacts. This entails such things as designing defence-in-depth safety systems for nuclear plants, shifting transmission lines to save rare habitats and building fish ladders to aid migration.

We've also had to respond to new problems that develop in older technologies. For instance, since the potential hazards of PCBs were identified, Ontario Hydro has been phasing out the use of equipment containing them. As well, we have developed a mobile decontamination unit that removes low-level PCBs from insulating oils.

We are committed to meet or better government standards or our own tough benchmarks. In most cases, we are successful. There are exceptions. We do

make mistakes. But we try to learn from them, to ensure they remain isolated incidents.

Despite efforts such as these, we are well aware there is much work to do in some areas. In the case of acid rain, we have met government regulations for reducing acid gas emissions. Overall, we have reduced emissions since 1982 by 25.8 per cent.

But we have our work cut out for us in the years ahead. Acid gas control regulations get progressively tougher until 1994 and uncontrollable circumstances can affect the year over year results. For instance, although Ontario Hydro emissions were below regulated limits in 1987, they were 25 per cent higher than in 1986 due to robust growth in the economy and a reduction in water for hydraulic generation.

All this means an even greater commitment from Ontario Hydro, especially since environmental work cannot be carried out in isolation from the other legitimate demands of society that Ontario Hydro provide its product and services reliably and at the most reasonable cost.

We are working to meet those demands as well. In 1987, Ontario Hydro continued to be financially self-sufficient while maintaining rate increases at or near inflation. Total revenues were up from 1986 because of increased electricity sales. Late this year, a 4.7 per cent average rate increase was set for 1988 to meet higher costs of operating and maintaining existing facilities.

In the next decade, annual energy consumption is expected to climb by a cumulative 29 per cent. We'd like it to be less, and we will be initiating more energy saving programs to address that objective. But in all probability, in a growing province, total energy consumption will rise. To meet that increase and maintain the integrity of the environment will test our ingenuity in maximizing the productivity of our existing system and in making sensible choices about future supply, from whatever source.

The employees of Ontario Hydro share the broader community's desire for clean water, pure air and a healthy ecosystem. Thus, the corporate commitment to minimize the impact on the environment is based on a personal commitment from each of the 24,000 people who make up Ontario Hydro.

It gives me great confidence for the future to be associated with people who have demonstrated time and again such dedication to this organization and to the people of the province.

I would like to thank retiring Chairman Tom Campbell, whose work encompassed projects crucial to the province's future power supply, such as the successful review of Darlington Nuclear Generating Station and the development of the Demand/Supply Planning Strategy. Tom's foresight and leadership produced a fine record of achievement in his four-year stewardship.





8 DEMAND FOR ELECTRICITY

CLIMBS 4.9 PER CENT
In 1987, Ontario Hydro continued to meet record demands for electricity. A total of 133 billion kilowatt-hours of electricity was delivered to primary and secondary customers. Primary demand rose to 126.5 billion kilowatt-hours, 4.9 per cent higher than the 1986 demand and 1.2 per cent higher than forecast. Electricity demand has increased steadily by an average annual growth rate of about 4.6 per cent since Ontario started to recover from the recession of the early 1980s. Ontario Hydro also sold 6.5 billion kilowatt-hours of electricity to utilities outside Ontario, chiefly in the United States.

The 1987 annual peak demand was 20.5 million kilowatts, 0.7 per cent lower than the 1986 annual peak. This slightly lower peak was due primarily to unseasonably mild temperatures during December.

MEETING CUSTOMERS' ELECTRICITY NEEDS

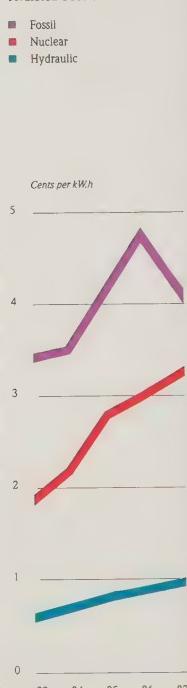
Ontario Hydro produces electricity from three major sources: hydraulic, fossil-fuel (predominantly coal), and nuclear. In 1987, hydraulic generation supplied 23.8 per cent, fossil-fuelled generation supplied 23.9 per cent, and nuclear generation supplied 47.5 per cent of the electricity required to meet customer demand.

Unusually dry and warm weather conditions resulted in lower water levels in 1987 forcing Ontario Hydro to burn

49 per cent more coal than forecast. In 1987, there were about 5.5 billion kilowatt-hours, or 15 per cent less hydraulic energy available than in an average year.

The remaining 4.8 per cent of Ontario's power requirements were met through purchases from other utilities, chiefly Hydro-Quebec and Manitoba Hydro. Ontario Hydro buys power from other utilities to help meet peak demand, to help supply electricity during emergency outages, and to reduce acid gas emissions. In 1987, Ontario Hydro agreed to buy 200 megawatts of power from Manitoba for five years starting in 1998.

AVERAGE COST OF GENERATION





Henry Kowalyk (front) and Scott McKinley of Ontario Hydro's Research Division work with BC Hydro to test the response of smolts, sockeye, and salmon to various diversion technologies including sound, strobe lights, and nets and screens.

MANAGING

ENVIRONMENTAL EFFECTS

Electricity cannot be produced and distributed without some effects on the environment. Recognizing that, Ontario Hydro's governing direction is to manage all activities affecting the environment in an ethical and socially responsible manner. Ontario Hydro's environmental policies include developing operational methods and new technology to minimize environmental effects.

Hydraulic Resources:

Respecting Borrowed Waters

Ontario Hydro uses water to generate electricity directly, and for cooling at fossil-fuelled and nuclear generating stations. It is Ontario Hydro's responsibility to ensure that water borrowed to make electricity is returned

with minimum change to lakes and rivers, and that the environment around all generating stations is preserved. That responsibility is met through a number of programs designed to overcome the different potential problems associated with using water for generating electricity, or for cooling.

Fish Diversion

Occasionally, the water intake tunnels at fossil and nuclear generating stations are blocked by fish. Ontario Hydro has developed a number of methods to divert the fish from the tunnels using such equipment as strobe lights, barrier nets, fish pumps and sonic devices. Ontario Hydro has also modified the design of water intake structures so they are less expensive and easier to build, and more effective at diverting

fish than earlier designs. This new kind of intake structure has been installed at the Darlington Generating Station.

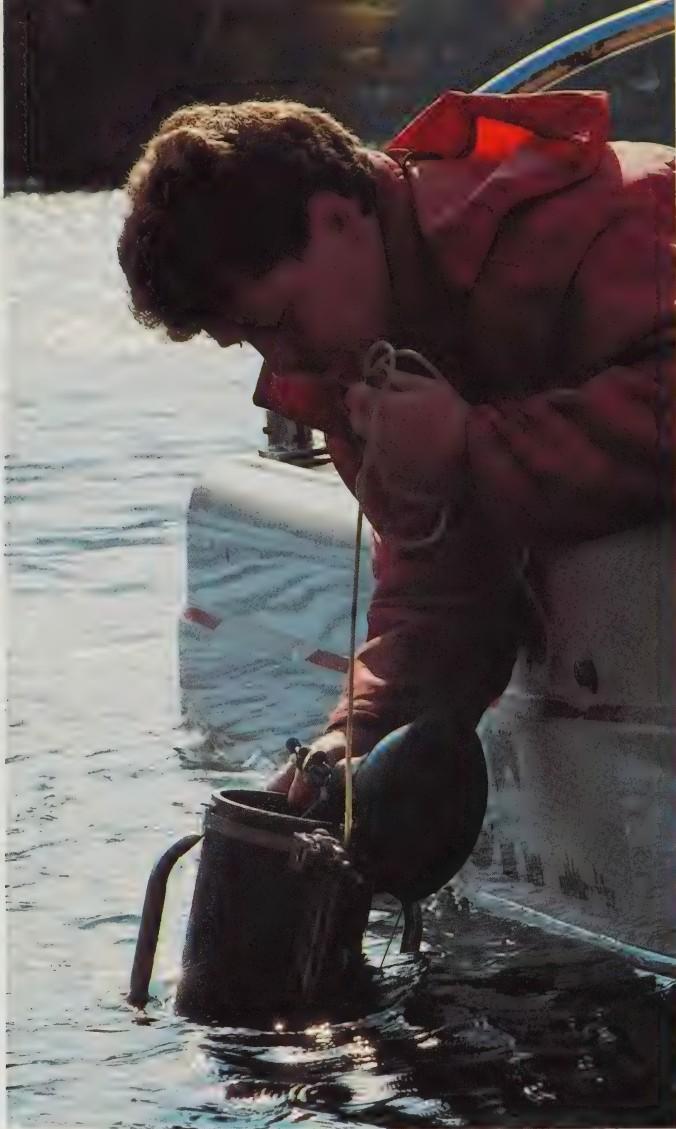
The Thunder Bay Generating Station has a unique "fish return" system. Fish entering the intake tunnel can be recovered and returned to the lake by travelling screens mounted with special buckets and a fish pump. Ontario Hydro has also installed fish ladders, such as the one at R.H. Saunders hydraulic station in Cornwall, to help migrating fish move around generating stations.

Water Flow and Quality

When a plant is built on a river system, the damming of water can change the river's level and flow. These changes are carefully controlled because they may affect fish and wildlife habitats. Wherever possible, stations



To identify, minimize and monitor environmental effects, and to satisfy government requirements, Ontario Hydro completes extensive environmental studies throughout the life of every project from pre-construction to post-operation.



At Six-Mile Lake, Biological Survey Technician Terry Brown samples the water from lake bottom to surface to help determine the environmental effects associated with the possible redevelopment of the Big Chute Hydraulic Generating Station.



Ontario Hydro staff met with the community in Beardmore, on the southeast shore of Lake Nipigon, to discuss possible environmental effects of a hydraulic development on the Little Jackfish River.

are operated to accommodate fish and wildlife needs.

This year, the driest on record for many parts of northern Ontario, the Corporation released some of the water stored behind its power dams to rivers and lakes to maintain walleye, salmon and pickerel spawning.

Keeping the water safe by maintaining its natural quality is also important. During the year, in response to the provincial Ministry of the Environment's Municipal-Industrial Strategy for Abatement (MISA) program, Ontario Hydro undertook a pre-regulatory identification of the chemical properties in its water effluents at fossil-fuelled, nuclear and hydraulic generating facilities. To date, chemical concentrations have been found to be within the expected range for normal operating conditions.

Ontario Hydro has also developed a containment valve designed to prevent spilled oil from entering a watercourse in the event of a transformer failure. In 1987, Ontario Hydro began installing these valves at DeCew Falls, the first of 42 hydraulic stations to be equipped.

Dam Safety and Rehabilitation

Ontario Hydro regularly inspects and monitors its dams to make sure surrounding lands are not flooded. This year, a routine inspection revealed an

unstable downstream slope on the DeCew Falls Generating Station headpond dam located on top of the Niagara Escarpment near St. Catharines. The slope was immediately stabilized.

The rehabilitation of Crystal Falls Dam, northwest of North Bay, was also completed in 1987; the main dam was replaced and new sluice gates were installed.

In addition to routine inspections, Ontario Hydro continued to evaluate the safety of its nearly 300 dams, according to modern engineering standards, as part of a special seven-year Dam Safety Assessment Program initiated in 1986.

Managing Shorelines

Changing water levels and river flows can contribute to the problem of erosion of reservoir shorelines and river banks. To help ease the problems of shoreline and river bank erosion, Ontario Hydro installs protective materials, such as rock layers, where necessary. Ontario Hydro stabilized the river banks along the Arnprior Generating Station reservoir, northwest of Ottawa, in this way in 1987.

Tapping more water power

As most of Ontario's accessible water power was developed before 1960, few opportunities for developing large and economical hydraulic stations now exist in the province. However, Ontario Hydro is studying the possible development of additional hydraulic sites or redevel-

opment of existing hydraulic stations to tap a potential of about 1000 megawatts of water power.

One of the first steps in every project is to determine possible environmental effects caused by a man-made installation.

In northern Ontario, field studies for the Little Jackfish and Mattagami Rivers are complete. An environmental assessment of Little Jackfish is being prepared for submission to the Ministry of the Environment in early 1988. As well, environmental studies are nearing completion on the Mattagami River development.

Ontario Hydro is also investigating the possibility of redeveloping Big Chute Generating Station on the Severn River, and adding additional generating facilities at Niagara Falls.

And Ontario Hydro continues to encourage the economic development of smaller hydraulic sites. Numerous proposals for small private hydraulic plants have been reviewed and are in various stages of planning and development. Seven projects, together producing a total of six megawatts, started selling power to Ontario Hydro in 1987.

FOSSIL FUEL - MAKING A VITAL CONTRIBUTION

Ontario Hydro's fossil-fuelled generating stations provide the system with the flexibility required to meet peak loads or cover outages at other plants.



Ontario Hydro and Ducks Unlimited Canada work together to preserve this 50-hectare wetland behind the Lennox Thermal Generating Station near Kingston. This marsh is home to ducks, terns, shorebirds, beavers and muskrats.

In 1987 the performance of Ontario Hydro's fossil-fuelled stations was a key factor in maintaining system reliability in the face of high energy demands and low water levels. Ontario Hydro burned 49 per cent more coal than expected and, as a result, acid gas emissions were 25 per cent higher than in 1986 but still 30,000 tonnes below the government limit.

Acid gas emissions are a combination of chemicals released during the coal combustion process. The chemicals most prominent, and of most concern, are sulphur dioxide and nitrogen oxide.

In 1981, Ontario Hydro announced a program to reduce acid gas emissions by almost 50 per cent beginning in 1986.

In 1985, the Ontario government announced a new regulation under the Environmental Protection Act which set still stricter limits on Ontario Hydro's acid gas emissions during the 1986 to 1993 period, and a new lower limit to be achieved by 1994.

Ontario Hydro will work to meet provincial government regulations limiting acid gas emissions (sulphur dioxide and nitrogen oxide) to 215,000 tonnes by 1994, 60 per cent below the 1982 peak level of 531,000 tonnes.

Reducing Pollution

To reduce acid gas emissions overall, Ontario Hydro runs its system using less fossil fuel and more nuclear and hydraulic generation whenever possible. To reduce sulphur dioxide emissions in particular, Ontario

Hydro purchases coal that is washed before delivery, burns lower sulphur coal from western Canada, and blends low-sulphur western Canadian coal with U.S. coal.

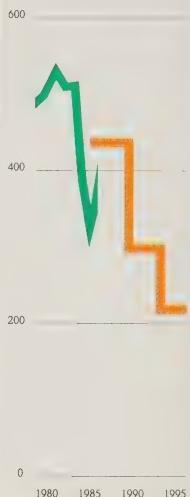
To reduce nitrogen oxide emissions, Ontario Hydro has installed low nitrogen-oxide burners at Nanticoke Generating Station. During 1987, the last three of Nanticoke's eight units were fitted with low nitrogen oxide burners. To date, with all eight units now modified, a 35 per cent reduction in Nanticoke's nitrogen oxide emissions has been achieved with some loss in combustion efficiency.

New Programs

This year, Ontario Hydro announced a major program to test the potential costs, benefits and problems of installing acid

ACID GAS EMISSIONS
Actual Limit

Thousands of Tonnes



gas control equipment at its three largest coal-fired generating stations, Nanticoke, Lakeview and Lambton. Provincial government approval, under the Environmental Assessment Act, is required before major modifications can be made to the stations.

Approval will be sought for four scrubbing technologies: wet limestone scrubbing, a limestone dual alkali process, a lime spray dryer process, and limestone injection. Over the next three years, Ontario Hydro will spend an estimated \$7.7 million consulting with the public, assessing the technologies and environmental effects, and seeking government approvals.

Lennox returned to operation

In November, two of the four 550-megawatt units at Lennox

Thermal Generating Station were returned to operation to maintain service reliability. These units are fuelled by residual oil, a refinery by-product with a low sulphur content of 0.7 per cent. The plant was mothballed in 1982, when primary load growth was lower than expected.

Managing Ash

Keeping the environment clean means disposing of the large quantities of ash produced from burning coal. The combustion of coal produces some coarse ash which falls to the bottom of the boiler, and tiny dust particles, called fly ash, 99 per cent of which are collected in electrostatic precipitators.

Ontario Hydro sells as much of the ash as possible. Some fly

ash is used to make cement and as an additive to concrete mixtures. Bottom ash is used as gravel.

In 1987, a system was added at Lambton Generating Station near Sarnia to collect dry fly ash so it could be used by a local waste management company to stabilize liquid wastes. Revenue from the sale of ash will cover the cost of the system in two years. Also in 1987, Lakeview's fly ash was sold to cement companies for use as an additive to concrete mixtures.

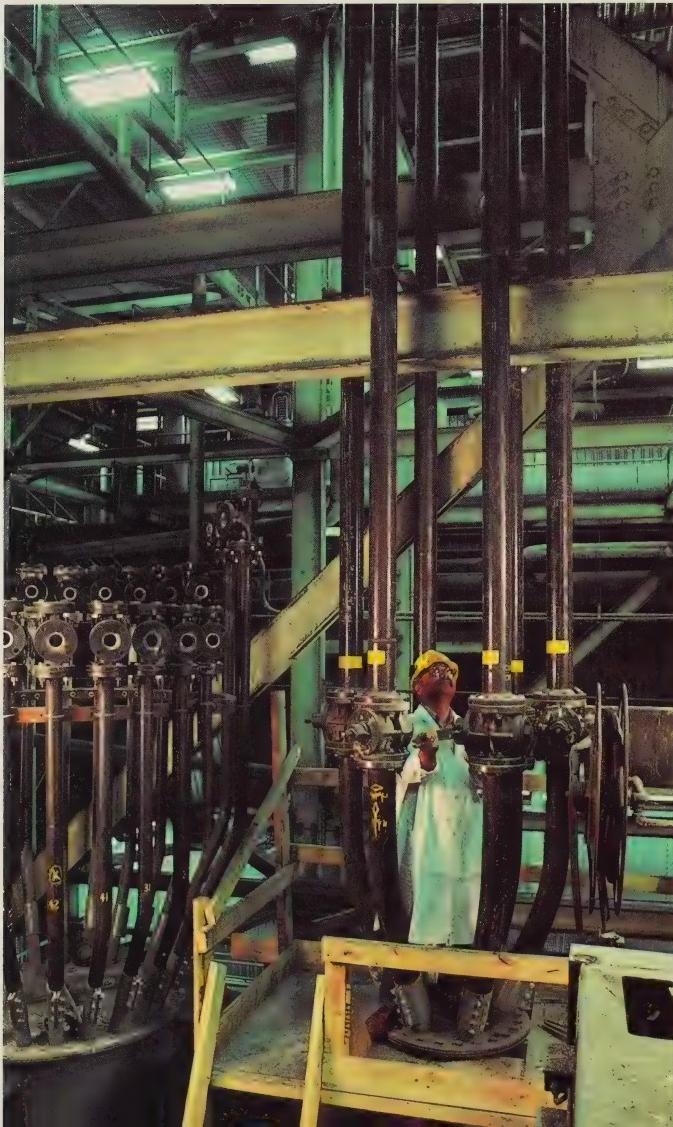
The ash that is not sold is buried in landfills built and managed by Ontario Hydro to prevent water pollution from runoff and leachings. Blowing dust from the sites is controlled by water sprays, bonding agents, and slag and vegetation cover. When the landfill site is full, it is revegetated.



As part of the Ontario Ministry of the Environment's Municipal Industrial Strategy Abatement (MISA) program, Stan Howser takes pre-regulatory samples of the water discharged from the Lakeview Generating Station.



To reduce acid gas emissions, Ontario Hydro designed and built the Thunder Bay Generating Station Extension to burn low-sulphur western Canadian coal. In all, Ontario Hydro's coal-fired stations contribute about 20 per cent of Ontario's acid gas emissions.



Ontario Hydro stockpiles coal at its fossil stations because it cannot be delivered during the winter months. By spraying the coal with water and waste oils, Ontario Hydro controls the blowing of coal dust year-round.

NUCLEAR ENERGY – AN INCREASING ROLE

Ontario Hydro's CANDU reactors generate electricity safely, economically, reliably and with minimum impact on the environment. Designed to shut down safely in the event of equipment failure, human error, or various combinations of both, these reactors have fast shutdown and vacuum systems to ensure safe operation and to prevent radioactive emissions from escaping into the atmosphere.

In 1987, construction continued at the Darlington Nuclear Generating Station. Darlington, scheduled to be producing power by 1989 will, when completed in 1992, provide 3600 megawatts of power, enough to meet the electricity needs of a population the size of metropolitan Toronto.

At the Bruce Nuclear Generating Station, Unit 8 went into service in May, two months ahead of schedule. Bruce Unit 5 surpassed the world record for continuous operation; it was connected to the electrical grid for 475 days.

The retubing of Units 1 and 2 at Pickering Nuclear Generating Station was completed, and Unit 1 was returned to com-

mercial operation in October. Unit 2 is expected to return to service in mid-1988.

Both units were taken out of service in 1983 when inspection of a failed pressure tube in Unit 2 signalled the end of the operating life of all pressure tubes in those units. Three hundred and ninety pressure tubes were replaced in each of the two 540-megawatt units. The workers were exposed to about one-third of the anticipated radiation exposure.

In 1987, during a routine inspection by Ontario Hydro and Atomic Energy of Canada Ltd., sample pressure tubes in Pickering Units 3 and 4 were found to be deteriorating faster than expected. As a result, the retubing of Pickering Units 3 and 4 will be advanced by approximately ten years.

In September, the CANDU reactor located at Rolphonton was permanently shut down. This 22-megawatt reactor, owned by Atomic Energy of Canada Ltd. and operated by Ontario Hydro, went into operation in 1962 to demonstrate the technical feasibility of CANDU nuclear generation, and to provide operating experience as a basis for the design, construction and operation of larger CANDU stations. Although intended only to demonstrate the CANDU concept, Rolphonton contributed power to the electricity grid for 25 years.

Ontario Hydro's CANDU units continued to rank among the world's top performing reactors. In 1987, seven units ranked in the top 15 in lifetime performance.

Nuclear Safety

Ontario Hydro's nuclear stations are designed and operated to protect employees, the public and the environment from radioactive emissions.

In over 20 years, more than 120 million person-hours, of Ontario Hydro nuclear plant operating experience, there has never been an on-the-job fatality at an Ontario Hydro nuclear generating station, and there has never been a radiation exposure resulting either in measurable injury to an employee or in a measurable exposure to a member of the public.

In fact, the average annual worker radiation exposure dropped to 0.4 rem in 1987, less than one-tenth of the annual exposure permitted for any one worker by the Atomic Energy Control Board. This reduction has taken place in spite of the major rehabilitation work at Pickering.



From left to right: Gunny Mentes, Wolf Jenkner, Al Christie, Ray Effer, Steve Griffiths and Ermund El'sayed, review the blueprints of the water intake structure at Darlington, which was designed by this team to prevent fish from entering the system.



16

Another important project undertaken by Ontario Hydro which also increases worker and public safety by helping to reduce radiation exposure is the tritium removal facility at Darlington. Designed to enable Ontario Hydro to use heavy water longer, the tritium removal facility will remove radioactive hydrogen from the heavy water used in the reactor systems at Ontario Hydro's nuclear stations. The facility is expected to begin operating in 1988.

As an extra safety measure, the air and water flowing from all nuclear stations are monitored by Ontario Hydro. Federal and provincial agencies ensure that concentrations of

radioactivity are within limits. They regularly analyze surrounding air, precipitation, milk, drinking water, algae and fish.

Also in 1987, Ontario Hydro participated in the Ontario Nuclear Safety Review. In 1986 the Ontario Energy Minister, acting on a recommendation by the Select Committee on Energy, appointed Professor F. Kenneth Hare to undertake the Ontario Nuclear Safety Review. The Review will report to the Minister of Energy early in 1988 on the safety of the design and operating procedures and emergency plans associated with Ontario Hydro's CANDU nuclear generating plants.

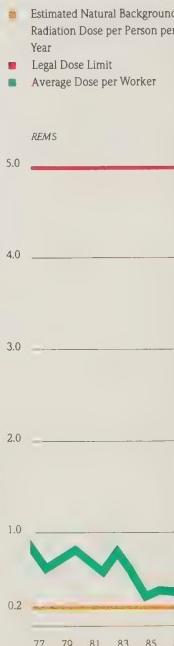
Employing Highly-Qualified Staff

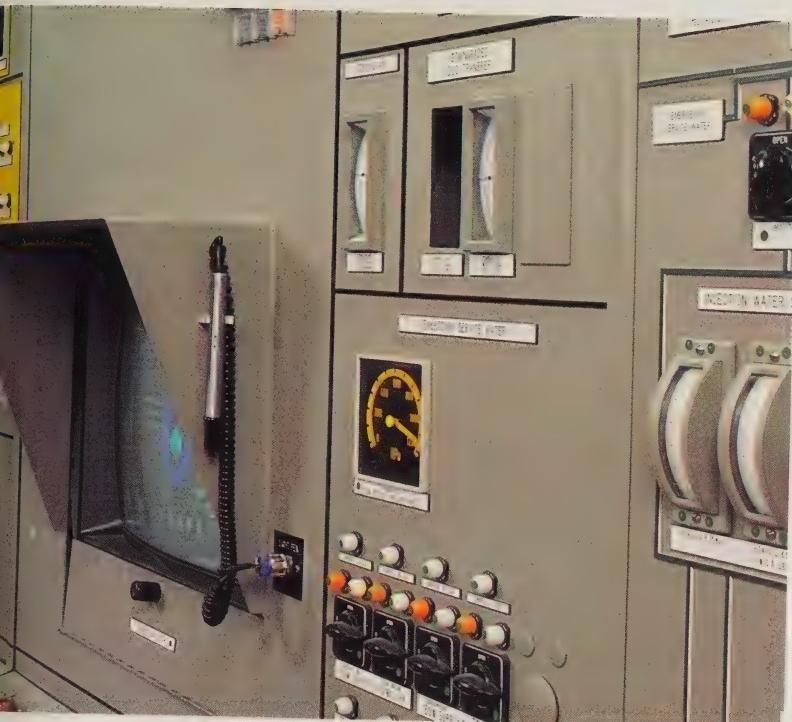
Ontario Hydro's nuclear operators and supervisors must meet high academic and security standards. Station control room operators receive at least eight years of training, followed by a series of demanding examinations set by Ontario Hydro and the federal Atomic Energy Control Board. After qualifying, operators take regular refresher training and demonstrate continued competence on training simulators.

Transporting Radioactive Materials

Ontario Hydro's careful packaging, compliance with legislation and regulations, driver/vehicle safety program and emergency response capabilities assure the

ANNUAL AVERAGE RADIATION DOSE PER NUCLEAR WORKER AT ONTARIO HYDRO





Ontario Hydro's nuclear station operators undergo a lengthy and rigorous training period. Here, from bottom-left to centre-right, Kerry Arnott, Steve Chornie, Mark Elliott, Randy Lockwood and Mike Lee, familiarize themselves with the control room at Darlington.

safe transportation of radioactive materials.

Since 1963, Ontario Hydro has made thousands of shipments of radioactive material over millions of kilometres. In that time three vehicular accidents have occurred, none of which resulted in any radiological danger to the public or the environment.

In the event of an accident, Ontario Hydro uses an independently evaluated emergency response plan which is considered a model by Transport Canada.

Nuclear Fuel Waste

Fuel bundles from nuclear reactors are highly radioactive and must be kept cool for some years after discharge. To achieve this, they are stored in water-filled pools at each nuclear generating station. For more

than 20 years, this method has proven safe, reliable and efficient. Because the compact fuel bundles require so little space for storage, this method can be used well into the next century.

Ontario Hydro is working with Atomic Energy of Canada Limited studying other possible short-term and long-term fuel storage methods.

DELIVERING ELECTRICITY CAREFULLY

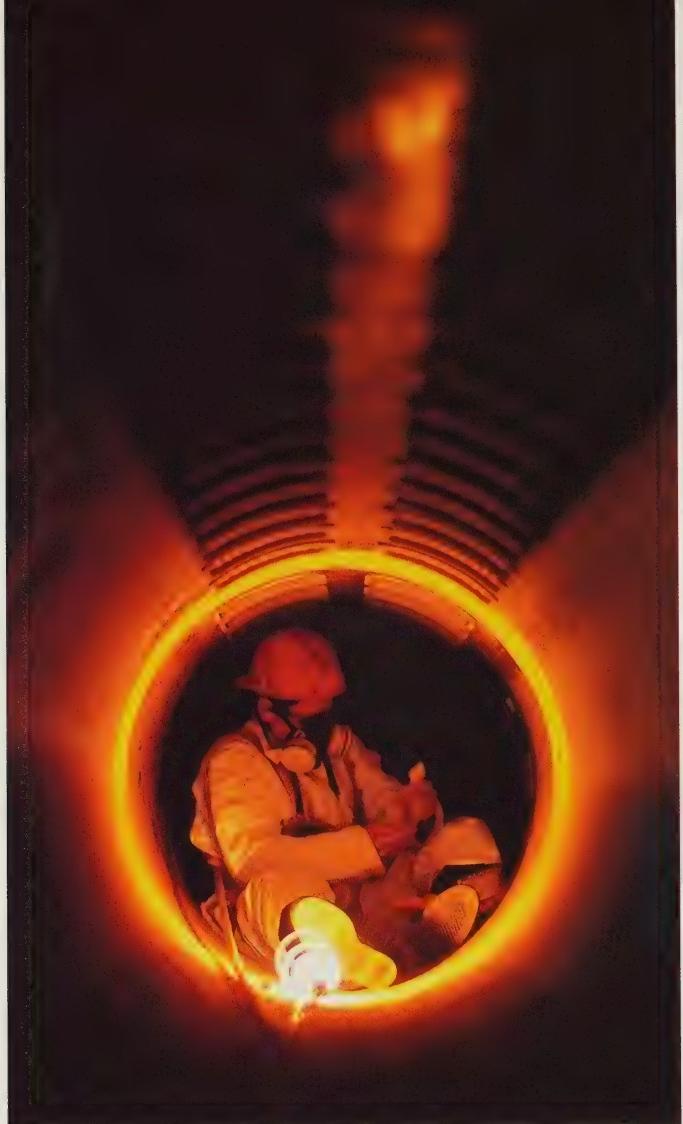
In addition to producing enough electricity to meet the province's requirements, Ontario Hydro must be able to deliver that electricity where it is needed, when it is needed. It is crucial to ensure the safety of those living near power corridors and to minimize damage to the surrounding natural environment.

In response to some public concerns about electric and magnetic fields, Ontario Hydro has expanded its activities in this area. Based on evidence to date, the scientific community agrees no public health risk has been established. However, Ontario Hydro, working with other utilities, is developing a risk assessment program to contribute to the resolution of public concerns. Ontario Hydro has also compiled a comprehensive database of scientific and legal information related to electric and magnetic field effects. This database is used internationally by the research community.

The effect of transmission lines on the environment is also addressed. When selecting a site for the transmission corridor, Ontario Hydro's policy is to



The warm water discharged from Pickering Nuclear Generating Station is used by Coolwater Farms Inc. to breed fish commercially.



Nuclear station components and systems are tested and inspected constantly throughout the life of every station. In this photo, one of the spray headers inside the vacuum building at Bruce is being removed for laboratory study.



As an extra safety precaution, Ontario Hydro is developing the capability to test the filters in respirator masks used by nuclear workers. Here, Dr. Helen Leung of Ontario Hydro's Research Division checks a filter.

avoid, where possible, recreational areas, forests, prime agricultural lands, lakes, rivers and streams susceptible to erosion problems, scenic areas, waterfowl, moose and deer habitats, and rare and endangered flora and fauna areas.

Once a transmission corridor has been approved by government, Ontario Hydro makes every effort to improve the aesthetic impact of the lines by selecting the transmission design most compatible with its surroundings, by landscaping, and by encouraging beneficial secondary uses of the altered land, such as parks and garden plots. This holds true for transformer stations also. For instance, in 1987, Ontario Hydro completed its reconstruction of the Toronto Cecil Transformer Station. The exterior of the building was renovated to blend in better with the neo-Victorian architecture of the neighborhood. Ontario Hydro worked with community and City of Toronto representatives.

New Transmission Lines

During 1987, new major transmission lines were brought into service for the first time in nearly five years. East of Toronto, the second 500-kilovolt double-circuit line from Cherrywood to Bowmanville was placed in service in May. As part of Ontario Hydro's acre-for-acre reforestation program, it donated 60,000 seedlings to the Central Lake Ontario Conservation Authority to replace trees that had to be cut down to build the transmission line. Further north, near Thessalon, the 500-kilovolt single-circuit Hamer-to-Mississagi line was placed in service in November. This line will operate initially at 230 kilovolts.

Plans and approval for major new 500-kilovolt transmission facilities in southwestern Ontario involved extensive environmental studies by Ontario Hydro. Approval for two 500-kilovolt transmission lines, one from Bruce Nuclear Power Development to a new transformer station near London, and the other from London to Nanticoke Thermal Generation Station, was granted by the Provincial Cabinet in June. Ontario Hydro held public information meetings to discuss the coming survey, property acquisition and construction phases of the project with over 1400 property owners and tenants along the route.

For five years, during and after construction, Ontario Hydro will monitor soil compaction, crop yield and land loss at towers as well as the effect of construction on tile drainage. Ontario Hydro will also evaluate the effect of its new narrow-base towers designed specifically for agricultural lands. These new towers use less land than other tower designs.

Ontario Hydro also resumed construction in Kanata on the Kingston to Ottawa transmission line. Work on the line stopped after a community group made an appeal to the Ontario Cabinet to review again any possible health effects. After considering the case, the Cabinet authorized Ontario Hydro to proceed with its work.

Ontario Hydro has also started its environmental studies to determine the best locations for future transmission facilities west and southwest of London to meet the growing electricity demand in the Windsor, Chatham and Sarnia areas.

Controlling Vegetation with Herbicides

The uncontrolled growth of brush and trees on some of Ontario Hydro's 200,000 hectares of transmission and distribution line rights-of-way and station sites can cause power failures and create a public or employee hazard. Therefore, the Corporation uses herbicides, along with some mechanical and manual methods, to control vegetation that may grow too close to electrical installations.

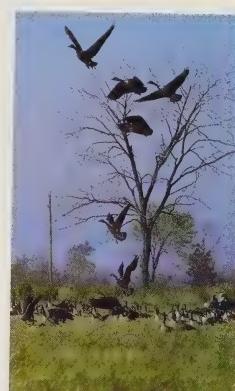
Only herbicides registered by the federal government and approved by the province are used by Ontario Hydro. These are applied in a selective manner so that vegetation not posing a problem is preserved. Herbicides are used in strict accordance with government regulations by staff trained in their use and supervised by employees licensed by the Ministry of the Environment.

In addition to herbicides, Ontario Hydro also controls vegetation manually, for example, when brush is too high, or where environmental conditions dictate. Landowners are also given the option to cut vegetation.

Ontario Hydro is continuing to develop and improve techniques to reduce herbicide use through such methods as encouraging the natural regeneration of low-growing ground cover and the seeding of cover crops.

Taking Care of PCBs

Since polychlorinated-biphenyls (PCBs) were identified in the 1970s as an environmental hazard, no new uses have been permitted. Many utilities, including Ontario Hydro, still use equipment containing PCBs as an insulator and fire retardant in electrical transformers and



Up to 30,000 Canada Geese land at the Jack Miner Bird Sanctuary in Kingsville every year during migration. This summer, to protect the migrating birds, Ontario Hydro buried the distribution line which ran parallel to the Sanctuary.

capacitors. Handling, storing and transporting this material safely while it is phased out is a priority at Ontario Hydro.

The Corporation has a number of programs under way to eliminate its PCB inventory and to ensure government regulations are met.

During the year, Ontario Hydro's Regions Branch conducted comprehensive audits of its field operations to ensure proper practices and procedures for the handling, storage, safety and record-keeping of PCBs are in place.

In addition to this control program, Ontario Hydro developed a mobile PCB-decontamination unit that chemically removes low-level PCBs from insulating oils so the oils can be reused. In August, the Ministry of the Environment granted the

necessary approvals for operating this unit, and the first commercial operation took place in October. By year end, 85,000 litres of contaminated oil, stored at an Ontario Hydro site in Etobicoke, had been cleaned. A second decontamination unit has been ordered to expedite the clean-up.

DEMAND MANAGEMENT—WORKING WITH THE CUSTOMER
Ontario Hydro markets electricity as a reliable, efficient and valuable energy form, suited to meet customers' needs in a wide variety of applications. At the same time, Ontario Hydro's objective is to manage electricity demands in a way that reduces or defers the need for new facilities. Demand management, by trying to make the best overall use of resources for the province, may also be a plus

for the environment. The less electricity that has to be produced, the fewer facilities required to generate and distribute it, thereby diminishing associated environmental effects.

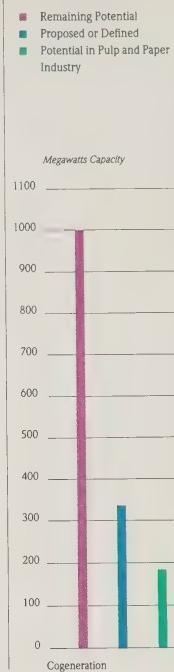
Effective demand management means working with customers to reduce waste, improve electricity efficiency, and develop new uses for electricity which represent a benefit for the customer and for the province.

Components of Ontario Hydro's demand management activities include natural and strategic (utility-induced) conservation, parallel generation and cogeneration, load shifting and time-of-use rates.

Conservation

By making the public more aware of energy efficiency programs and financial incentives,

COGENERATION POTENTIAL IN ONTARIO, 1981-2000



Ontario Hydro expects to encourage electricity users to conserve enough power by the year 2000 to reduce demand by at least 1000 megawatts.

One effort to promote more efficient use of electricity is the energy monitoring program. Launched in conjunction with the Ministry of Energy in 1986, this program offers a system to measure more precisely the energy consumed by a specific portion of an industrial process. Fuel savings to the consumer are expected to average about 16 per cent with a typical pay-back period of one year. During 1987, nine companies across the province signed up to participate in the program.

Rate Incentives, Flexible Financing

Rate incentive programs have been developed to help pulp

and paper industries modernize their operations. By converting to electromechanical pulping, a more efficient process that streamlines operations and results in lower unit cost, companies can improve product quality and reduce pollution emission levels.

Ontario Hydro's commercial and industrial customers can also arrange more flexible financing for energy efficiency improvements. Through the EnerMark Business Finance Plan, sponsored by Ontario Hydro and the Canadian Imperial Bank of Commerce, most customers can obtain 100 per cent financing.

Parallel Generation

Parallel generation refers to electricity generated from a private source, not owned or operated by Ontario Hydro,

but connected to its system. Ontario Hydro estimates up to 1000 megawatts of electrical power may be available from parallel generation by the year 2000.

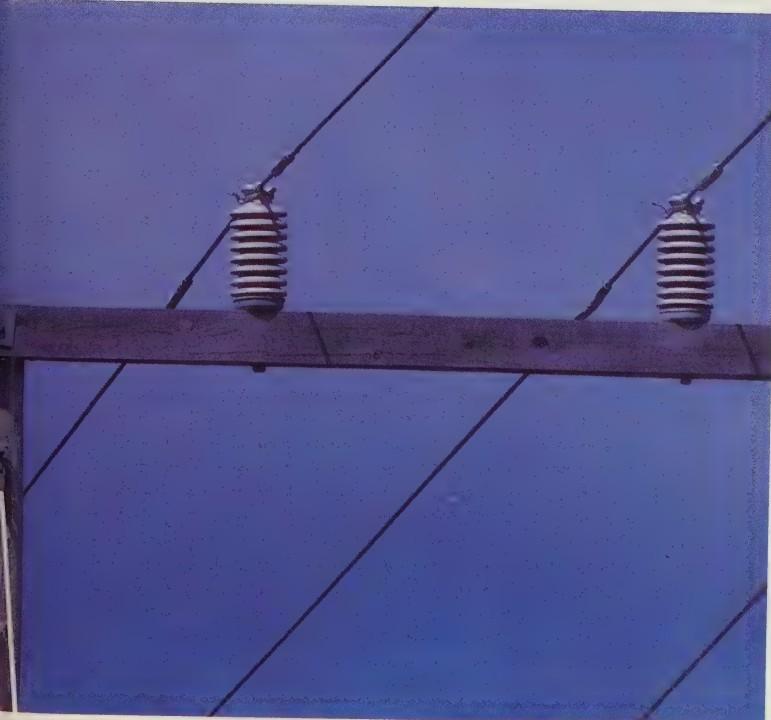
At the end of 1987, Ontario Hydro was buying close to 26 megawatts of parallel power from 22 parallel generators. In 1987, Ontario Hydro raised the purchase rates to 3.60 cents a kilowatt-hour from 3.25 cents for capacity factors of 65 per cent or higher.

Cogeneration

Cogeneration, a form of parallel generation, involves the production of heat and electricity from a single fuel source. Ontario Hydro is encouraging the development of cogeneration projects in Ontario, particularly in the north, to help meet



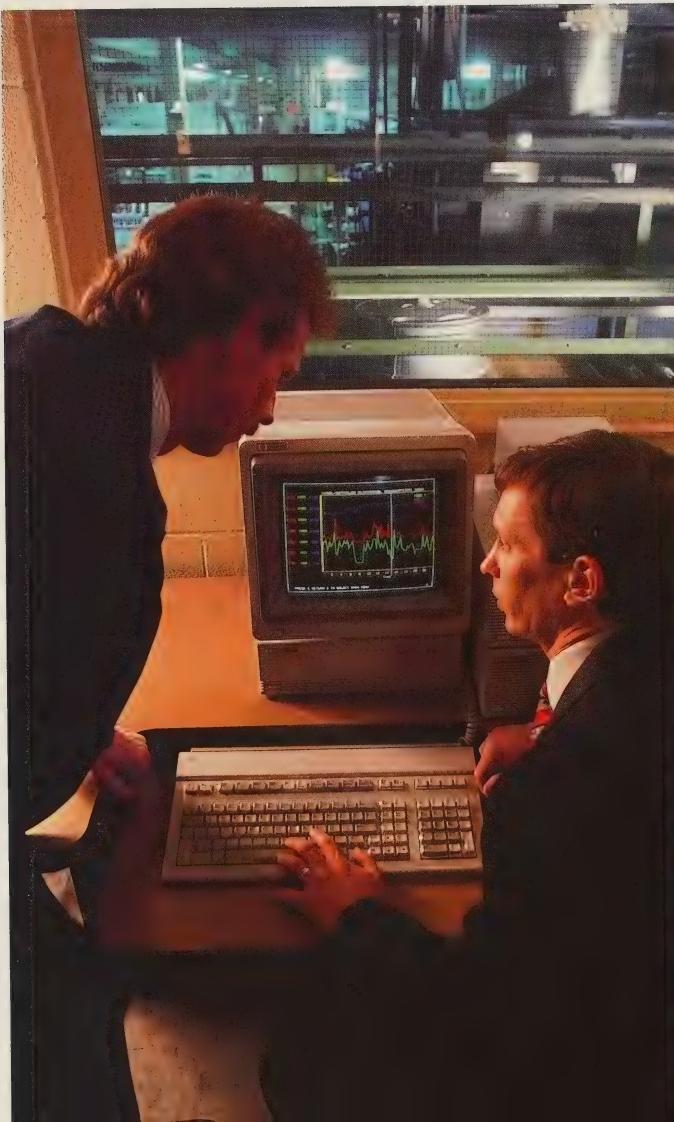
To ensure noise from transmission lines is within acceptable environmental limits, Ontario Hydro has been studying noise levels under different weather conditions for the past three years. Here, technologist Mike Colbert, takes measurements on an autumn morning at the Trafalgar test site in Milton.



Rather than relocating osprey nests, which can weigh up to 30 kilograms, Ontario Hydro will, whenever possible, widen the cross-piece and shift the nest away from the line. Here, journeyperson Bill Curry adjusts an osprey nest on a newly constructed cross-piece on a distribution pole near Belleville.



The reconstruction of the Cecil Transformer Station in downtown Toronto was completed in 1987. Ontario Hydro worked with representatives from the City and the neighbouring community to change the exterior of the building.



Ron Brunstad, Accounting/Systems Supervisor at Volkswagen, and Don Fleming (right), Marketing Supervisor at Ontario Hydro, discuss the energy monitoring system recently installed in Volkswagen's Barrie plant. The system will help lower electricity costs by reducing peak energy by up to 15 per cent.

electricity needs without building new facilities. Cogeneration now supplies about 500 megawatts of electricity in Ontario.

In 1987, Ontario Hydro and Great Lakes Forest Products Limited agreed to develop a new cogeneration plant in northwestern Ontario that will cut Ontario Hydro's requirement to supply the company's future energy needs by about 22 megawatts.

As well, Ontario Hydro and InterCity Gas continue to discuss a proposal to build a 75-megawatt cogeneration facility at Boise Cascade's Fort Frances site. InterCity Gas, the owner of the facility, would sell the steam it produces to Boise-Cascade and the electricity to Ontario Hydro. A feasibility study is under way now.

Time-of-Use Rates

Ontario Hydro, the Municipal Electric Association, and the Association of Major Power Consumers in Ontario have agreed on a series of rate structure reforms which will allow Hydro to track costs more equitably and will help customers reduce their individual bills by managing their own electricity use. After review by the Ontario Energy Board, these reforms are expected to be implemented in 1989. Time-of-use rates will be applied initially to direct customers and large users within municipal utilities. Customers will be charged for electricity according to the time of day and season they use it. The rates will reflect the costs of providing electricity and will be lowest during the summer off-peak period and highest during the winter peak hours. Individual municipal utilities will have the option of adopting time-of-use rates in 1989.

Related Business Activities

Ontario Hydro is involved in a number of secondary activities related to the production of electricity. For example, Ontario Hydro exports its design, construction and operating expertise in the electricity field to countries around the world. In 1987, the Canadian Exporters Association recognized Ontario Hydro's New Business Ventures Division as one of Canada's outstanding exporters.

During the year, government and utility delegates from Brazil spent a week at Ontario Hydro examining how to incorporate environmental considerations into the planning and design stages. Procedures for developing and establishing policies to offset the environmental effects of an electric utility were also studied. In other technological areas, Ontario Hydro continued its consulting work in Ghana, Egypt, Pakistan, Yemen, Kenya and several other countries. New contracts were signed for consulting work with Belize, Ethiopia and Zimbabwe.

The Corporation also sells heat energy, in the form of steam, for commercial and industrial uses. Ontario Hydro is participating in the promotion of heat energy use at the Bruce Energy Centre, an industrial park east of the Bruce Nuclear Power Development in Bruce County. In 1987, Bi-Ax International Incorporated and Bruce Tropical Produce Incorporated, both Canadian-owned companies, became the first customers to build facilities at the Bruce Energy Centre.

OTHER ENERGY OPTIONS

Ontario Hydro continues to explore a broad range of energy options, such as fuel cells, fusion fuel, municipal solid waste, and wind and solar generation. In

the past several years, Ontario Hydro has studied wind and solar power in particular, as they may prove economical in remote locations.

Because Ontario is one of the least windy areas in North America, wind generation is not practical for most of Ontario. However, wind turbines may prove to be feasible in remote communities where wind currents are stronger and electricity is generated from more costly diesel power plants. To test this potential, Ontario Hydro installed a 60-kilowatt turbine at Fort Severn which began producing power in 1987.

Sunlight, converted directly to electricity through photovoltaic cells, is another potential energy resource. Although the cost of these cells has decreased dramatically over the years, it is still too high for all but remote applications where it can provide an economic alternative to expensive diesel power. Ontario Hydro has solar-cell test facilities north of Atikokan, and at the Kortright Conservation Centre near Toronto. The most recent installation, at Big Trout Lake, in northern Ontario, is Canada's largest. Three hundred photovoltaic modules produce up to 11 kilowatts of power, reducing the use of diesel fuel.

ONTARIO HYDRO'S WORK ENVIRONMENT

Ontario Hydro relies on its staff of about 24,000 regular employees and 8,000 temporary and construction staff to keep the province's large electricity system producing and delivering power.

During the year, Ontario Hydro continued to work with employees to ensure a satisfying work environment. In March,



Renewable energy options such as wind-powered electrical generation can play an important role in specialized applications. In 1987, a wind turbine installed at Fort Severn, on Hudson Bay, began producing power to displace some of the costly diesel fuel used in the local generator.

Ontario Hydro and the Ontario Hydro Employees' Union reached a landmark voluntary three-year collective agreement. The Society of Ontario Hydro Professional and Administrative Employees, another employee group representing some 6600 administrative, supervisory, engineering, and other professional staff, continued to seek certification as a trade union.

To support the health and well-being of its employees, Ontario Hydro initiated a program to reduce exposure to tobacco smoke at the workplace a year ago. In 1987, smoking was prohibited in the workplace at Ontario Hydro's Head Office and Toronto locations.

The quality of Ontario Hydro's safety programs at its construction and operating sites was confirmed again in 1987. This was the third consecutive year there were no on-the-job fatalities.

Affirmative Action

Ontario Hydro's provincially recognized Affirmative Action program continued to encourage the movement of qualified women into all major job categories. Overall, the representation of women increased from 17.9 per cent of the regular staff in 1986 to 19 per cent at the end of 1987. The number of women on the Executive Salary Roll increased from 3.3 per cent to 3.4 per cent; in the Management and Professional category from 8.7 per cent to

9.7 per cent; and in the Trades, Technical and Operators category from 2.8 per cent to 3.6 per cent.

Maternity leave benefits improved in 1987. As a result of labour negotiations, benefits increased to 93 per cent of salary for normal maternity leave.

In July, President Bob Franklin announced a corporate Employment Equity Program expanding the mandate of the Affirmative Action Program to include visible minorities, aboriginal and disabled persons.

THE PUBLIC ENVIRONMENT

Ontario Hydro, as a public utility, is accountable to the people of Ontario. To understand and respond to the varying needs and expectations of its customers, Ontario Hydro, in addition to the daily exchanges between employees and the public, consults with the people of Ontario through formal hearing bodies, informal consultations and tours of and visits to facilities.

This year Ontario Hydro spent about 85,000 hours and \$5 million participating in public hearings before the Ontario Energy Board, the Select Committee on the Environment, the Special Acid Rain Committee of the House of Commons, the Standing Committee on Energy of the House of Commons, the Environmental Assessment Board, the Federal Ad Hoc Committee on Great Lakes Water Levels, and the Advisory Committee of the Federal Government's Energy Options Program. As well, Ontario Hydro

participated in the Ontario Nuclear Safety Review.

Ontario Hydro works with communities and considers the effects of its projects and operations not only on the natural environment, but also on the social and community environment. Behind every project are years of planning with community members to moderate the effect of a new Ontario Hydro project on the local economy and culture, housing markets, school systems, leisure facilities and so on. While a project is under construction or in operation, close contact with the community is maintained to manage related effects.

To further strengthen public representation from every corner of the province, in 1987, the Ontario government appointed six individuals from northern Ontario to form a special advisory committee to provide northern Ontario residents with direct input into Ontario Hydro's decisions. The committee will deal with all aspects of Ontario Hydro's operations in northern Ontario, and make recommendations to the Ontario Hydro Board of Directors.

In less formal settings, more than 100,000 people visited Ontario Hydro's nine information centres located across Ontario. And Ontario Hydro Speakers' Bureau arranged 511 speaking engagements to community, business and service groups throughout the province.

FINANCIAL HIGHLIGHTS

Ontario Hydro's activities continue to be directed at achieving its primary purpose of providing the customers of Ontario with electricity at the lowest feasible cost over the long term consistent with high safety and quality of service standards. To accomplish this, Ontario Hydro encourages the effective use of resources and emphasizes productivity improvements and cost control.

Ontario Hydro's total revenues for 1987 amounted to \$5,280 million, \$427 million higher than in 1986. Approximately \$232 million of this increase came from a greater volume of electricity sales, and \$195 million from the 1987 rate increase. Total operating costs for 1987, including financing charges, amounted to \$5,009 million, an increase of \$403 million over 1986. This increase was primarily due to higher fuel costs and higher operating and maintenance costs. The net income for 1987 was \$271 million compared with \$247 million for 1986.

Cash provided from operations and available for investment in fixed assets was \$1,204 million for 1987. The capital expenditures for investment in fixed assets during 1987 amounted to \$2,524 million. This represents a decline over the period 1983 through 1987 as a result of the decrease in the level of construction activity.

RESULTS OF OPERATIONS

Revenues

Primary revenues for 1987 amounted to \$5,084 million, an increase of \$479 million or 10.4 per cent as compared with 1986. Electricity sales to municipal utilities, rural retail and direct industrial customers totalled 120,218 million kilowatt-hours. The overall growth rate in the volume of primary energy sales was 4.8 per cent for 1987, reflecting the effect of continued economic growth in the Province of Ontario and weather related factors. In 1987, electricity sales to municipal utilities and direct industrial customers grew more strongly than sales to rural retail customers. The chart provides the energy consumption by major customer category and an estimate of the energy consumed by market sector. The overall growth rate for 1987 was generally consistent with the average annual growth rate of 4.6 per cent over the last five years.

The 1987 electricity rates for primary customers increased 5.5 per cent on average. The average increases for municipal utilities, rural retail and direct industrial customers were 5.2 per cent, 6.6 per cent and 5.6 per cent, respectively. The rural rate increase takes into account \$91 million in assistance provided by all electricity consumers in the province to reduce the electricity bills of year-round rural residential customers.

Secondary revenues for 1987, mainly from sales of electricity to United States utilities, amounted to \$196 million.

Compared with 1986, this represents a decrease of \$52 million or 21.0 per cent. This decrease reflects a shift in the pattern of secondary sales from relatively higher-priced firm contract sales to interruptible, non-firm sales. In addition, this decrease is due to a more competitive export market as a result of lower oil prices for U.S. electric utilities which makes imports less attractive for them.

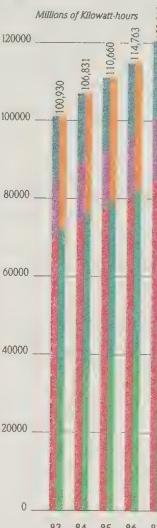
Over the last five years, Ontario Hydro has sold to U.S. utilities approximately 43,595 million kilowatt-hours of electricity beyond the requirements of its customers in Ontario and has earned approximately \$1,665 million in secondary revenues. The net benefit to Ontario customers was \$634 million for the period 1983 through 1987, and \$61 million in 1987. This benefit helped Ontario Hydro to keep electricity rates lower for Ontario customers.

Major Electricity Production Resources

Ontario Hydro responds instantly and efficiently to the energy demands of its customers by supplying electricity from a number of different sources. Hydraulic generating stations, which are relatively inexpensive to operate, have traditionally provided a major part of the electricity energy generated by Ontario Hydro. With most major accessible sites in the province already developed, hydraulic generation, as a percentage of total generation,

PRIMARY ENERGY

Customer Category

has gradually decreased over the past few years. On the other hand, the Corporation has increased its emphasis on nuclear generation. This emphasis is part of Ontario Hydro's acid gas emission reduction efforts. The other major source of generation of electricity is fossil generation. The increased nuclear generating capacity reduces the need to operate coal-fired generating units which have higher fuelling costs. However, the fossil-fuelled units will continue to be required during periods of higher demand, when demand cannot be satisfied by less expensive generation. The electricity production resources for the period 1983 through 1987, illustrating the changes in volume and generation mix, are shown in the chart. The annual average cost per kilowatt-hour of energy by the major generating sources are shown in the Five-Year Summary of Financial and Operating Statistics.

Fuel and Fuel-related Costs
In 1987, fuel and related costs such as water rentals, power purchased, and the nuclear agreement-payback were 20.1 per cent higher than in 1986. Ontario Hydro's nuclear stations supplied 47.5 per cent of the total energy to the system in 1987. Hydraulic stations supplied 23.8 per cent and fossil-fuelled generation provided 23.9 per cent. Purchases of

power from interconnected utilities provided the remaining 4.8 per cent. In 1986, electric energy from nuclear generation, hydraulic generation and fossil-fuelled generation supplied 46.0 per cent, 29.4 per cent and 18.9 per cent, respectively, of the total energy to the system.

The 1987 fuel costs for coal, uranium, and oil amounted to \$1,124 million, an increase of 20.5 per cent over 1986. This increase is primarily due to higher coal costs associated with the increased level of electricity generated by coal-fired stations. This increased coal-fired generation is mainly attributable to a decrease in the availability of lower cost hydraulic generation as a result of lower than normal precipitation. The increase in fuel costs is also due to a higher level of energy demand.

The payments Ontario Hydro makes primarily to the Province of Ontario for the use of provincial waters in its hydraulic plants amounted to \$90 million in 1987, a decrease of \$1 million over 1986. This reflects the effect of the decrease in hydraulic generation in 1987 compared with 1986, offset by the impact of the increase in water rental rates.

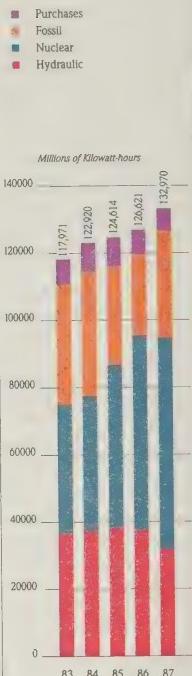
Electricity purchased from neighbouring utilities amounted to \$117 million in 1987, a decrease of \$11 million over 1986. These purchases are generally made during periods of peak demand or emergency situations so as to maintain a reliable supply of electricity.

In 1983, units 1 and 2 of the Pickering Nuclear Generating Station were taken out of operation to replace existing pressure tubes. Unit 1 has returned to operation in October 1987 and unit 2 is expected to return to operation in 1988. The maintenance and overhead costs during the shutdown period have been included in the payback calculation according to the Pickering Payback Agreement. As a result, Ontario Hydro was able to reduce its 1987 and 1986 operating costs by \$23 million and \$63 million respectively, which represents the amount to be offset against future amounts payable by Ontario Hydro to Atomic Energy of Canada Limited and the Province of Ontario, the other two parties to this agreement.

Operation, Maintenance and Administration

The costs associated with the operation, maintenance and administration of the Corporation in 1987 were \$1,150 million, an increase of \$136 million over 1986. This increase of 13.4 per cent is primarily related to placing new facilities in service, and cost escalation in labour and other costs. The in-service capacity of the generation system grew about 3 per cent or 837 megawatts in 1987, reflecting the addition of one nuclear generating unit. The transmission and distribution

ELECTRICITY PRODUCTION



system work-load also grew in 1987, as reflected in an increase of approximately 3 per cent in the number of customers and an increase of about 1 per cent in the kilometres of rural lines maintained. The chart shows the operation, maintenance and administration costs by major activity for the period 1983 through 1987.

Depreciation

The depreciation charged to operations totalled \$723 million in 1987, \$18 million or 2.6 per cent higher than in 1986. Contributing to this increase were the additional facilities placed in service, including Bruce unit 8, and the full year's impact of Pickering unit 8 and Bruce unit 7, partially offset by the effect of a lower provision for fuel channel removal costs in 1987. The decrease in this provision is due primarily to a reduction in the estimated fuel channel removal costs for Pickering units 1 and 2, which has now been substantially completed.

Financing Charges

Financing charges are comprised of interest and foreign exchange costs. Interest charged to operations represents the total cost of borrowing less interest capitalized. This is designed to effect a proper allocation of costs between current and future customers. Foreign exchange mainly represents the amortization of gains or losses on the principal amount of foreign debt.

Gross interest costs for 1987 amounted to \$2,744 million, an increase of \$60 million or 2.2 per cent as compared with 1986. The primary reason for this increase is related to the additional funds borrowed during the year to finance the construction of new generating stations which are needed to meet future demand. This increase was partially offset by the effect of a stronger Canadian dollar relative to the United States dollar on foreign currency interest payments, as well as the effect of refinancing debt that matured during the year at lower interest rates.

Interest charged to operations amounted to \$1,702 million in 1987, \$117 million or 7.4 per cent higher than in 1986. The increase resulted primarily from placing an additional nuclear generating unit in service in 1987, and the full year's impact of units placed in service in 1986. The in-service date is the time from which interest is no longer capitalized and is charged to operations.

Foreign exchange costs amounted to \$126 million in 1987, a decrease of \$87 million or 40.8 per cent over 1986. The primary factor contributing to the decrease in foreign exchange costs was the effect of the rise in value of the Canadian dollar relative to the United States dollar.

Net Income/Financial Indicators

Ontario Hydro earned a net income of \$271 million in 1987, compared with \$247 million in 1986. Ontario Hydro's main financial indicators are the debt,

cash flow coverage and interest coverage ratios. The debt ratio at the end of 1987 was .836 as compared to the 1986 ratio of .835. The cash flow coverage for 1987 was 1.08, the highest level since 1981. The level of interest coverage for 1987 and 1986 were 1.10 and 1.09 respectively. The financial position of the Corporation remains strong.

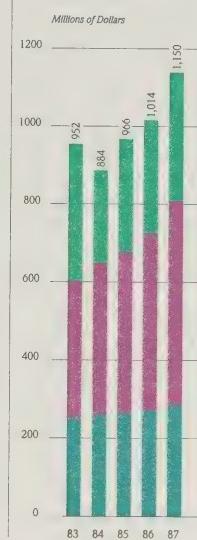
CAPITAL EXPENDITURES AND FINANCING

Investment in Fixed Assets
Ontario Hydro invests in fixed assets to meet expected growth in the demand for electricity, to replace existing assets with facilities that are more economical, and to meet regulatory requirements. The total assets of the Corporation at the end of 1987 were \$32,657 million and of this amount, about 86 per cent consists of fixed assets in service and under construction. This relatively high percentage reflects the capital-intensive nature of Ontario Hydro's business.

The investment in fixed assets during 1987 was \$2,524 million. A major portion of the 1987 capital expenditures went toward the construction of new generating facilities. In addition, the 1987 capital expenditures reflect the continued emphasis being placed on investment in transmission and distribution facilities to improve the quality and reliability of service.

OPERATION, MAINTENANCE AND ADMINISTRATION

- Administration and Support Services
- Generation
- Transmission and Distribution



The expenditures on major capital projects under construction during 1987 and 1986 were:

	1987	1986
	millions of dollars	
Nuclear Generation		
Darlington	1,282	1,131
Bruce	145	279
Pickering	24	34
Generating Facilities	1,451	1,444
Transmission and Distribution	495	422

Ontario Hydro placed in service unit 8 at Bruce in May, 1987, at a total cost of \$1,633 million, including \$308 million for heavy water. In addition, two 500-kilovolt transmission lines in the northeastern and southeastern regions of the Province of Ontario were placed in service in 1987 at a total cost of \$129 million.

There has been a modest decline in the annual investment in fixed assets from \$2,746 million in 1983 to \$2,524 million in 1987, as the major generating projects are completed. The expenditures for investment in fixed assets for the period 1983 through 1987 are shown in the chart.

Financing

Cash required by Ontario Hydro to finance the investment in fixed assets is provided from two major sources: cash provided from operations and cash from external borrowings. For 1987, cash provided from operations and cash from financing were \$1,204 million and \$1,330 million respectively. Cash from borrowings represents the amount of cash provided from the issuance of long-term debt and the increase in the level of short-term notes payable issued for debt management purposes, less the amount of cash used to retire long-term debt.

The proceeds from the issue of bonds sold to the public by Ontario Hydro during 1987 amounted to \$1,585 million, and the proceeds from the issue of bonds to the Province of Ontario with respect to Canada Pension Plan funds provided a further \$302 million. These proceeds were from eight Canadian issues with an average coupon interest rate of 9.6 per cent for an average term of 8.0 years. For the same period in 1986, the average coupon interest rate and the average term of new debt issued were 9.2 per cent and 8.1 years respectively. In

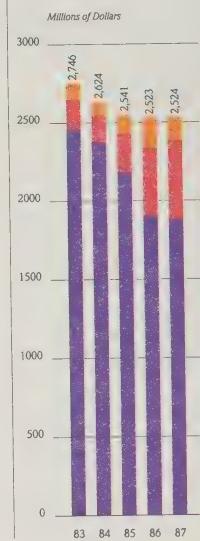
addition, proceeds of \$397 million were received from the issuance of long-term notes. Ontario Hydro also issues floating rate short-term notes, with terms to maturity of less than one year, as part of its debt management activities. In 1987, the level of short-term notes payable issued for debt management purposes increased by \$250 million.

Cash provided from financing from 1983 through 1987 is shown in the chart. The principal markets Ontario Hydro has operated in are the Canadian, United States, and Eurodollar public markets. Financing activities for 1987, were met entirely from the Canadian market and from Canada Pension Plan funds to minimize foreign exchange exposure.

Cash amounting to \$1,096 million was used to retire maturing long-term debt in 1987, compared with \$321 million in 1986. In addition, during 1987, cash amounting to \$108 million was used to redeem debt prior to maturity, compared with \$353 million in 1986.

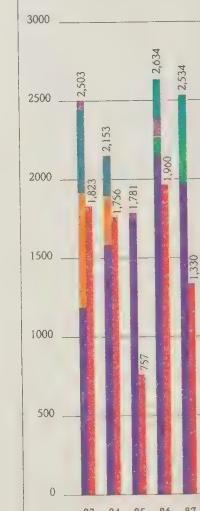
INVESTMENT IN FIXED ASSETS DURING THE YEAR

- Administration and Service Facilities
- Transmission and Distribution Facilities
- Generating Stations



CASH PROVIDED FROM FINANCING

- Other Debt Issues
- Eurodollar Issues
- Canada Pension Plan Funds
- Short-term Notes Payable Issued for Debt Management Purposes
- U.S. Issues
- Canadian Issues
- Cash Provided from Financing



The accompanying financial statements have been prepared in accordance with accounting principles generally accepted in Canada. Such principles, except for the change in the accounting policy for pension costs as described under "Pension plan" and in note 14 to the financial statements, have been applied on a basis consistent with that of the preceding year. The significant accounting policies followed by Ontario Hydro are described below.

Rate setting

Ontario Hydro has broad powers to generate, supply and deliver electric power throughout the Province of Ontario. The Corporation operates under the Power Corporation Act and is subject to provisions of the Ontario Energy Board Act.

Under the provisions of the Power Corporation Act, the price payable by customers for power is the cost of supplying the power. Such cost is defined in the Act to include the cost of operating and maintaining the system, depreciation, interest, and the amounts appropriated for debt retirement and stabilization of rates and contingencies. The debt retirement appropriation is the amount required under the Act to accumulate on a sinking fund basis over 40 years a sum equal to the debt incurred for the cost of the fixed assets in service. The appropriation for, or withdrawal from, the stabilization of rates and contingencies reserve is an amount established to maintain a sound financial position and to stabilize the effect of cost fluctuations.

Under the provisions of the Ontario Energy Board Act, a public hearing before the Ontario Energy Board is required in respect of any changes in electricity rates proposed by Ontario Hydro which affect its municipal utilities, direct industrial customers, or, if the Minister of Energy so directs, rural retail customers. The Ontario Energy Board submits its recommendations to the Minister of Energy. After considering the recommendations of the Ontario Energy Board, the Board of Directors of Ontario Hydro, under the authority of the Power Corporation Act, establishes the electricity rates to be charged to customers.

If the Board of Directors specifies a certain cost or gain is to be included in future electricity rates that, in accordance with the accounting policies summarized below, would be charged or credited to operations in the current year, then this cost or gain is deferred and amortized to future operations on a basis consistent with its inclusion in rates.

Fixed assets

Fixed assets in service include operating facilities and non-operating reserve facilities. Construction in progress includes fixed assets under construction and heavy water held for use in nuclear generating stations under construction.

Fixed assets are capitalized at cost which comprises material, labour, engineering costs, and the costs of training initial operating staff for new facilities as well as overheads, depreciation on service equipment, and interest applicable to capital construction activities. In

the case of generation facilities, the cost also includes the net cost of commissioning, and for nuclear generation, the cost of heavy water. The net cost of commissioning is the cost of start-up less the value attributed to energy produced by generation facilities during their commissioning period. The cost of heavy water comprises the direct cost of production and applicable overheads, as well as interest and depreciation on the heavy water production facilities and the estimated removal costs of these facilities. For multi-unit facilities, a proportionate share of the cost of common facilities is placed in service with each major operating unit. Leases which transfer the benefits and risks of ownership of assets to Ontario Hydro are capitalized.

Interest is capitalized on construction in progress at rates (1987 - 11.4 per cent, 1986 - 12.9 per cent) which approximate the average cost of long-term funds borrowed in the years in which expenditures have been made for fixed assets under construction. If the construction period of a project is extended and the construction activities are continued, interest is capitalized during the period of extension provided that the project has a reasonable expectation of being completed.

If a project is cancelled or deferred indefinitely with a low probability of construction being resumed, all costs including the costs of cancellation are written off to operations.

If fixed assets are removed from operations and mothballed for future use, termed non-operating reserve facilities, the costs of mothballing are charged to operations.

Depreciation

The capital costs of fixed assets in service are depreciated on a straight-line basis. Depreciation rates for the various classes of assets are based on their estimated service lives. Major components of generating stations are depreciated over the lesser of the service life expectancy of the component or the remaining service life of the associated generating station.

The estimated service lives of assets in the major classes are:

Generating stations — hydraulic	— 65 to 100 years
— fossil	— 30 to 35 years
— nuclear	— 40 years
Heavy water	— over the period ending in the year 2040
Transmission and distribution facilities	— 20 to 55 years
Heavy water production facilities	— 20 years
Administration and service facilities	— 5 to 60 years

In accordance with group depreciation practices, for normal retirements the cost of fixed assets retired is charged to accumulated depreciation with no gain or loss being reflected in operations. However, gains and losses on sales of fixed assets, and losses on premature retirements are charged to operations in the year incurred as adjustments to depreciation expense.

When the costs of removal less residual value, termed removal costs, on retirements of fixed assets can be reasonably estimated and are significant, provisions for these costs, except for those related to heavy water production facilities, are charged to depreciation expense on an annuity basis over the remaining service life of the related fixed assets. For heavy water production facilities, provisions for removal costs are charged to heavy water production costs on a straight-line basis over the remaining service life of the related facilities. Other removal costs are charged to depreciation expense as incurred. Removal costs include the estimated costs of decommissioning nuclear stations and heavy water production facilities, and the estimated costs of removing certain nuclear reactor fuel channels.

The estimated service lives of fixed assets and the significant assumptions underlying the estimates of fixed asset removal costs are subject to periodic review. Any changes arising out of such a review are implemented on a remaining service life basis from the year the changes can be first reflected in electricity rates.

Non-operating reserve facilities are amortized so that any estimated loss in value is charged to depreciation expense on a straight-line basis over their expected non-operating period.

Unamortized advances for fuel supplies

As part of its program to ensure the adequate supply of fuels for its generating stations, Ontario Hydro has entered into long-term fuel supply contracts. Where these contracts require Ontario Hydro to make payments for pre-production costs to suppliers in advance of the fuel delivery, these payments and associated costs, including interest, are carried in the accounts as unamortized advances for fuel supplies. The advances are amortized to fuel inventory as the fuels are delivered.

Fuel for electric generation

Fuel used for electric generation comprises the average inventory costs of fuel consumed, charges for commissioning energy produced, and provisions for disposal of nuclear fuel irradiated during the period. The inventory cost of fuel consumed comprises fuel purchases, transportation and handling costs, and the amortization of advances for fuel supplies. Transportation costs include charges for interest and depreciation on railway equipment owned by Ontario Hydro. The charges for commissioning energy produced during the period represent the incremental operating and fuel costs of producing the same quantity of energy at generating units displaced because of the commissioning activity. The costs for disposal of nuclear fuel irradiated in each period are charged to operations based on estimated future expenditures and interest accumulating to the estimated date of disposal. Estimates of expenditures, interest and escalation rates, and the date of disposal are subject to periodic review. Adjustments resulting from changes in estimates are charged to operations on an annuity basis over the period from the year the changes can be first reflected in electricity rates to the estimated in-service date of the disposal facility.

Foreign currency translation

Current monetary assets and liabilities in foreign currencies are translated to Canadian currency at year-end rates of exchange and the resultant exchange gains or losses are credited or charged to operations. Long-term debt payable in foreign currencies is translated to Canadian currency at year-end rates of exchange. Resulting unrealized exchange gains or losses are deferred and included in unamortized debt costs, and are amortized to operations on an annuity basis over the remaining life of the related debt.

Foreign exchange gains or losses on hedges of long-term debt payable in foreign currencies are deferred and included in unamortized debt costs. The deferred gains or losses related to principal payments are amortized to operations on an annuity basis over the remaining period through to the year in which the hedged principal payments are due. The deferred gains or losses related to interest payments are credited or charged to operations in the year in which the hedged interest payments are due.

Foreign exchange gains or losses on early redemption of long-term debt are deferred and included in unamortized debt costs if the exposure in the foreign currency related to the redeemed debt is not reduced as a result of the refinancing of the redeemed debt in the same currency. These deferred gains or losses are amortized on an annuity basis over the period to the original maturity date of the redeemed debt. If the foreign currency exposure is reduced as a result of the early redemption of debt, the resulting foreign exchange gains or losses related to the redeemed debt are credited or charged to operations.

Unamortized debt costs

Unamortized debt costs include the unamortized amounts related to unrealized foreign exchange gains or losses resulting from the translation of foreign currency long-term debt, foreign exchange gains or losses on hedges, foreign exchange gains or losses on the early redemption of long-term debt, discounts or premiums arising from the issuance of debt or the acquisition of debt prior to maturity, and discounts or premiums accrued on foreign currency hedges.

Debt discounts or premiums arising from the issuance of debt are amortized over the period to maturity of the debt. Discounts or premiums on debt acquired prior to the date of maturity are amortized over the period from the acquisition date to the original maturity date of the debt. Discounts or premiums on foreign currency hedges are credited or charged to operations over the terms of the individual hedges.

Nuclear agreement—Pickering units 1 and 2

Ontario Hydro, Atomic Energy of Canada Limited and the Province of Ontario are parties to a joint undertaking for the construction and operation of units 1 and 2 of Pickering Nuclear Generating Station, with ownership of these units being vested in Ontario Hydro.

Contributions to the capital cost by Atomic Energy of Canada Limited and the Province of Ontario amounted to \$258 million and these have been deducted in arriving at the value of fixed assets in service in respect of Pickering units 1 and 2. Ontario Hydro is required to make monthly payments until the year 2003 to each of the parties in proportion to their capital contributions. These payments, termed "payback", represent in a broad sense the net operational advantage of having the power generated by Pickering units 1 and 2 as compared with coal-fired units similar to Lambton units 1 and 2.

Pension plan

The pension plan is a contributory, defined benefit plan covering all regular employees of Ontario Hydro. Ontario Hydro is responsible for all deficiencies and surpluses in the pension plan.

Effective January 1, 1987, Ontario Hydro implemented the new recommendations of the Canadian Institute of Chartered Accountants with respect to pension costs and obligations. Accordingly, pension costs for accounting purposes are actuarially determined based on the assumptions that reflect management's best estimate of the effect of future events on the actuarial present value of accrued pension benefits, and the valuation of pension plan assets using a five-year market value average. Pension plan surpluses and deficiencies are amortized on an annuity basis over the expected average remaining period of service of the employees covered by Ontario Hydro's pension plan.

Prior to January 1, 1987, pension costs were actuarially determined based on assumptions used for funding purposes. Any net unfunded liability arising from past service obligations was amortized up to fifteen years. All other net unfunded liabilities or net surpluses were amortized up to five years.

Research and development

Research and development costs are charged to operations in the year incurred, except for those related directly to the design or construction of a specific capital facility which are capitalized as part of the facility.

MANAGEMENT'S RESPONSIBILITY FOR FINANCIAL REPORTING

The accompanying financial statements of Ontario Hydro are the responsibility of management and have been prepared in accordance with accounting principles generally accepted in Canada. Such principles, except for the change in the accounting policy for pension costs as described in the accompanying Summary of Significant Accounting Policies and in note 14 to the financial statements, have been applied on a basis consistent with that of the preceding year. The significant accounting policies followed by Ontario Hydro are described in the Summary of Significant Accounting Policies. The preparation of financial statements necessarily involves the use of estimates based on management's judgement, particularly when transactions affecting the current accounting period cannot be finalized with certainty until future periods. The financial statements have been properly prepared within reasonable limits of materiality and in light of information available up to March 14, 1988. The information presented elsewhere in the Annual Report is consistent with that in the financial statements.

Management maintains a system of internal controls designed to provide reasonable assurance that the assets are safeguarded and that reliable financial information is available on a timely basis. The system includes formal policies and procedures and an organizational structure that provides for appropriate delegation of authority and segregation of responsibilities. An internal audit function independently evaluates the effectiveness of these internal controls on an ongoing basis and reports its findings to management and to the Audit Committee of the Board of Directors.

The financial statements have been examined by Clarkson Gordon, independent external auditors appointed by the Lieutenant Governor in Council of Ontario. The external auditors' responsibility

is to express their opinion on whether the financial statements are fairly presented in accordance with generally accepted accounting principles. The Auditors' Report, which appears below, outlines the scope of their examination and their opinion.

The Board of Directors, through the Audit Committee, is responsible for ensuring that management fulfills its responsibilities for financial reporting and internal controls. The Audit Committee meets periodically with management, the internal auditors and the external auditors to satisfy itself that each group has properly discharged its respective responsibility, and to review the financial statements before recommending approval by the Board of Directors. The external auditors have direct and full access to the Audit Committee, with and without the presence of management, to discuss their audit and their findings as to the integrity of Ontario Hydro's financial reporting and the effectiveness of the system of internal controls.

On behalf of Management

R. G. Franklin

E. H. Sundew

Chairman and President

Executive Vice-President,

Finance and Planning

Toronto, Canada,

March 14, 1988.

AUDITORS' REPORT

To the Board of Directors of Ontario Hydro:

We have examined the statement of financial position of Ontario Hydro as at December 31, 1987 and the statements of operations, equities accumulated through debt retirement appropriations, reserve for stabilization of rates and contingencies and source of cash used for investment in fixed assets for the year then ended. Our examination was made in accordance with generally accepted auditing standards, and accordingly included such tests and other procedures as we considered necessary in the circumstances.

In our opinion, these financial statements present fairly the financial position of Ontario Hydro as at December 31, 1987 and the

results of its operations and the changes in its financial position for the year then ended in accordance with generally accepted accounting principles. Further, in our opinion, such principles, except for the change in the accounting policy for pension costs as described in the Summary of Significant Accounting Policies and in note 14 to the financial statements, have been applied on a basis consistent with that of the preceding year.

Toronto, Canada,
March 14, 1988.

CLARKSON GORDON
Chartered Accountants

STATEMENT OF OPERATIONS

ONTARIO HYDRO

for the year ended December 31, 1987

1987

1986

millions of dollars

Revenues		
Primary power and energy		
Municipal utilities	3,441	3,116
Rural retail customers	968	885
Direct industrial customers.	675	604
	5,084	4,605
Secondary power and energy (note 1)	196	248
	5,280	4,853
Costs		
Operation, maintenance and administration	1,150	1,014
Fuel used for electric generation.	1,124	933
Water rentals (note 2)	90	91
Power purchased	117	128
Nuclear agreement—payback (note 3)	(23)	(63)
Depreciation (note 4)	723	705
	3,181	2,808
Income before financing charges.	2,099	2,045
Interest (note 5)	1,702	1,585
Foreign exchange (note 6)	126	213
	1,828	1,798
Net income	271	247
Appropriation for (withdrawal from):		
Debt retirement	319	292
Stabilization of rates and contingencies.	(48)	(45)
	271	247

See accompanying summary of significant accounting policies and notes to financial statements.

as at December 31, 1987

1987 1986
millions of dollars**Assets**

Fixed assets (note 7)		
Fixed assets in service	25,788	23,312
Less accumulated depreciation	5,581	4,946
	<hr/>	<hr/>
Construction in progress	20,207	18,366
	7,779	7,737
	<hr/>	<hr/>
	27,986	26,103
	<hr/>	<hr/>
Current assets		
Cash and temporary investments	215	285
Accounts receivable	584	543
Fuel for electric generation (note 8)	1,039	1,065
Materials and supplies, at cost	287	281
	<hr/>	<hr/>
	2,125	2,174
	<hr/>	<hr/>
Other assets		
Unamortized debt costs	940	1,597
Unamortized advances for fuel supplies (note 9)	777	884
Unamortized deferred costs (note 10)	473	283
Long-term accounts receivable and other assets	356	316
	<hr/>	<hr/>
	2,546	3,080
	<hr/>	<hr/>
	32,657	31,357
	<hr/>	<hr/>

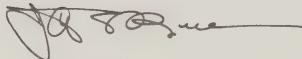
	1987	1986
	<i>millions of dollars</i>	
Liabilities		
Long-term debt (note 11)	23,862	23,494
Current liabilities		
Accounts payable and accrued charges	624	473
Short-term notes payable	502	255
Accrued interest	705	742
Long-term debt payable within one year	1,202	1,076
	3,033	2,546
Other liabilities		
Long-term accounts payable and accrued charges	183	136
Accrued fixed asset removal and irradiated fuel disposal costs (note 12)	617	490
	800	626
Contingencies (notes 9, 10 and 14)		
Equity		
Equities accumulated through debt retirement appropriations	3,229	2,910
Reserve for stabilization of rates and contingencies	1,606	1,654
Contributions from the Province of Ontario as assistance for rural construction	127	127
	4,962	4,691
	32,657	31,357

On behalf of the Board

35



Chairman and President



Vice-Chairman

Toronto, Canada,
March 14, 1988.

**STATEMENT OF EQUITIES ACCUMULATED
THROUGH DEBT RETIREMENT APPROPRIATIONS**

ONTARIO HYDRO

for the year ended December 31, 1987

	Municipal Utilities	Power District (Rural Retail and Direct Industrial Customers)	Totals
	millions of dollars		
Balances at beginning of year	2,027	883	2,910
Appropriation	218	101	319
Balances at end of year	<u>2,245</u>	<u>984</u>	<u>3,229</u>
			<u>2,910</u>

**STATEMENT OF RESERVE FOR STABILIZATION
OF RATES AND CONTINGENCIES**

for the year ended December 31, 1987

	Held for the benefit of all customers	Held for the benefit of (or recoverable from) certain groups of customers	Totals
	Municipal Utilities	Rural Retail Customers	Direct Industrial Customers
	millions of dollars		
Balances at beginning of year	1,704	1	(41)
Appropriation (withdrawal)	(51)	—	5
Balances at end of year	<u>1,653</u>	<u>1</u>	<u>(36)</u>
			<u>(12)</u>
			<u>1,606</u>
			<u>1,654</u>
			<u>(45)</u>
			<u>1,699</u>

See accompanying summary of significant accounting policies and notes to financial statements.

**STATEMENT OF SOURCE OF CASH USED
FOR INVESTMENTS IN FIXED ASSETS**

ONTARIO HYDRO

for the year ended December 31, 1987

	1987	1986
	<i>millions of dollars</i>	
Cash provided from operations (note 13)	1,204	1,040
Cash provided from financing		
Long-term debt issued	2,284	2,384
Change in short-term notes payable issued for debt management purposes—increase	250	250
Less long-term debt retired	2,534	2,634
Cash provided from financing	1,204	674
	1,330	1,960
Cash (used for) provided from investment in other assets (note 13)	(149)	70
Cash provided from operations, financing and other activities	2,385	3,070
Changes in cash and cash equivalents—decrease (increase) (note 13)	67	(485)
Cash used for investment in fixed assets	2,452	2,585
Changes in accounts payable and accrued charges affecting investment in fixed assets—increase (decrease)	72	(62)
Investment in fixed assets (note 13)	2,524	2,523

See accompanying summary of significant accounting policies and notes to financial statements.

1. Secondary power and energy

Secondary power and energy revenues include \$194 million (1986—\$247 million) from sales of electricity to United States utilities.

2. Water rentals

Water rentals are the amounts paid primarily to the Province of Ontario for the use of water for hydraulic generation.

3. Nuclear agreement—payback

In 1987, the Nuclear Agreement, which is described in the Summary of Significant Accounting Policies, was amended by the parties to the agreement to reflect the settlement in principle reached in 1986. The amendment to the agreement confirms Ontario Hydro's interpretation that the negative payback amounts accumulated during the 1983 through 1988 shutdown period for replacement of pressure tubes in Pickering Nuclear Generating Station units 1 and 2 can be offset against future positive payback amounts payable to Atomic Energy of Canada Limited and the Province of Ontario after the units return to operation. The

negative payback amounts, totalling \$205 million as of December 31, 1987, have been credited against the costs of operations for the period 1983 through 1987, and are included in "long-term accounts receivable and other assets". The amendment establishes that the negative payback amounts accumulated during the shutdown period of these units, plus interest, are to be recovered by Ontario Hydro over the remaining term of the agreement, commencing with the return to operation of the last of the two units. Pickering unit 1 returned to operation in 1987 and unit 2 is expected to return to operation in 1988.

4. Depreciation

	1987	1986
	<i>millions of dollars</i>	
Depreciation of fixed assets in service.....	717	638
Amortization of deferred costs.....	40	41
Fixed asset removal costs		
—provision for fuel channel removal costs	35	83
—provision for decommissioning costs	17	23
—other removal costs.....	14	15
	<hr/> 823	<hr/> 800
Less:		
Depreciation charged to—heavy water production	51	51
—construction in progress	38	33
—fuel for electric generation	2	2
Net gain on sales of fixed assets	9	9
	<hr/> 100	<hr/> 95
	<hr/> 723	<hr/> 705

5. Interest

	1987	1986
	<i>millions of dollars</i>	
Interest on bonds, notes, and other debt.....	2,694	2,650
Interest on accrued fixed asset removal and irradiated fuel disposal costs.....	50	34
	<hr/> 2,744	<hr/> 2,684
Less:		
Interest charged to—construction in progress	772	807
—heavy water production	98	112
—fuel for electric generation	108	102
—unamortized advances for fuel supplies	—	17
Interest earned on investments	64	61
	<hr/> 1,042	<hr/> 1,099
	<hr/> 1,702	<hr/> 1,585

6. Foreign exchange

	1987	1986
	<i>millions of dollars</i>	
Amortization of foreign exchange gains and losses	93	189
Net exchange loss on other foreign transactions	33	24
	126	213

7. Fixed assets

	1987		
	Assets in Service	Accumulated Depreciation	Construction in Progress
<i>millions of dollars</i>			
Generating stations—hydraulic	1,863	599	41
—fossil	3,618	1,338	47
—nuclear	10,450	1,188	6,162
Heavy water	2,432	210	949
Transmission and distribution	5,130	1,388	516
Heavy water production facilities	1,128	393	—
Administration and service facilities	1,167	465	64
	25,788	5,581	7,779
	1986		
	Assets in Service	Accumulated Depreciation	Construction in Progress
<i>millions of dollars</i>			
Generating stations—hydraulic	1,844	572	26
—fossil	3,610	1,232	24
—nuclear	8,823	942	6,188
Heavy water	2,117	171	997
Transmission and distribution	4,748	1,283	425
Heavy water production facilities	1,128	339	—
Administration and service facilities	1,042	407	77
	23,312	4,946	7,737

Fossil generating stations in service include non-operating reserve facilities. As at December 31, 1987, the capital cost and accumulated depreciation of these non-operating fossil-fuelled facilities amounted to \$488 million and \$352 million, respectively (1986—\$785 million and \$448 million, respec-

tively). Substantially all of the undepreciated cost of these facilities is related to the two units (1986—four units) at the Lennox generating station which, based on current forecasts, are expected to return to operation by the mid-1990s. In 1987, two units at Lennox returned to operation.

7. Fixed assets (continued)

Construction in progress at December 31, 1987:	<i>Remaining Number of Units Scheduled</i>	<i>Planned In-Service Dates</i>	<i>Dependable Capacity to be Placed in Service</i>	<i>Costs Incurred to December 31, 1987</i>	<i>Estimated Cost to Complete</i>
			<i>megawatts</i>	<i>millions of dollars</i>	
Darlington Nuclear Generating Station (including heavy water).....	4	1989-92	3,524	6,766	4,632
All other construction in progress	-	-	-	1,013	-
				7,779	

Estimated cost to complete is the most recent projection and includes cost escalation and interest amounting to approximately \$2,558 million. Cost escalation and interest are forecast to average 6% and 11% per year, respectively, over the period 1988 to 1992. Because of the uncertainties associated with long construction lead times and planned in-service dates, this estimated cost to complete is subject to change.

The fuel channel replacement program for Pickering Nuclear Generating Station units 1 and 2 is estimated to cost \$457 million. Of this total,

\$332 million is to be capitalized as installation costs, and the remaining \$125 million is related to the removal costs of the existing pressure tubes and is being recovered through charges to operations. As of December 31, 1987, the actual expenditures for installation costs, including interest of \$81 million, totalled \$303 million, and the actual expenditures for fuel channel removal costs totalled \$120 million. Pickering unit 1 returned to operation in 1987 and unit 2 is expected to return to operation in 1988.

8. Fuel for electric generation

	<i>1987</i>	<i>1986</i>
	<i>millions of dollars</i>	
Inventories—uranium	643	586
—coal	381	479
—oil	15	-
	1,039	1,065

9. Unamortized advances for fuel supplies

	<i>1987</i>	<i>1986</i>
	<i>millions of dollars</i>	
Uranium—Rio Algom Limited	422	431
—Denison Mines Limited	345	359
	767	790
Coal	10	94
	777	884

Unamortized advances for fuel supplies are recovered as fuel is delivered. Over the next five years, the amortization of advances for uranium supplies will be approximately \$23 million for the contract with Rio Algom Limited and approximately \$62 million for Denison Mines Limited.

Ontario Hydro has entered into long-term contracts with Denison Mines Limited and Rio Algom Limited for uranium supplies through to 2012 and 2027, respectively. Ontario Hydro's current forecast of the annual requirements for uranium is approximately 1,200 megagrams for 1988, increasing to approximately 1,700 megagrams by 1994. The uranium inventory as at December 31, 1987 plus the contracted deliveries through to 1994 exceed the forecasted requirements up to 1994 by approximately 300 megagrams. Commencing in 1994 through to 2012, contracted deliveries exceed forecasted requirements of the nuclear generating facilities currently in service and under construction by

approximately 1,000 megagrams per year. Ontario Hydro's options for managing the oversupply include resale of the uranium and, under specified conditions, cancellation or renegotiation of the contracts. In the event that a contract is cancelled, the supplier is not required to refund any outstanding advances. At this time, the likelihood of a contract cancellation and the financial implications of pursuing the options are not determinable.

On November 17, 1987, Ontario Hydro provided USX Corporation with notification of cancellation of the Coal Purchase Agreement pursuant to the three year notice period provision in the Agreement as described in note 10. As a consequence, \$85 million of the unamortized advances for coal supply was transferred to "Unamortized deferred costs" as at December 31, 1987.

10. Unamortized deferred costs	1987	1986
	<i>millions of dollars</i>	
Bruce Heavy Water Plant "D"	222	259
Wesleyville Generating Station	20	24
	<hr/>	<hr/>
Fuel oil contract	242	283
Coal Purchase Agreement	146	-
	<hr/>	<hr/>
	85	-
	<hr/>	<hr/>
	473	283

Bruce Heavy Water Plant "D" is an indefinitely deferred project with a low probability of construction being resumed. The capital cost of this project and the unamortized deferred costs associated with the cancelled Wesleyville generating station project were not written off directly to operations since the Board of Directors under its rate setting authority determined that these costs be amortized for recovery through electricity rates over the period 1984 through 1993, which results in an annual charge of \$40 million in 1987.

On September 18, 1987, Ontario Hydro and Petrosar Limited reached a settlement with respect to the fuel oil contract. Under the terms of the settlement, Ontario Hydro paid \$150 million to Petrosar Limited, and the parties released each other from all obligations and claims related to the contract. The amount of this payment, less a provision of approximately \$4 million which was charged to operations in prior years, was not charged directly to operations since the Board of Directors under its rate setting authority determined that this cost be deferred and amortized for recovery through electricity rates on a straight-line basis over the period from 1988, the first year such cost can be reflected in rates, through 1992. Accordingly, no amount was charged to operations in 1987.

In 1974, Ontario Hydro entered into a Coal Purchase Agreement (the "Agreement") with USX Corporation (formerly, United States Steel Corporation) to develop and operate the Cumberland Mine so as to produce coal for Ontario Hydro through to approximately 2015. An economic analysis based on performance of the Cumberland Mine to date and projection of future costs has determined that the reduced

costs associated with future coal purchases from alternative sources will more than offset costs of cancelling the Agreement. Accordingly, on November 17, 1987, Ontario Hydro provided USX Corporation with notification of cancellation of the Agreement pursuant to the three year notice period provision in the Agreement. If USX Corporation decides not to continue operating the Cumberland Mine after cancellation of the Agreement, Ontario Hydro is liable for certain lease obligations and mine shutdown costs. At this time, the likelihood of USX Corporation deciding not to continue operating the mine is not determinable. Furthermore, the amount of such costs in the event of discontinued operation of the mine are subject to negotiation. Accordingly, no provision for such costs has been reflected in the financial statements. Under the Agreement, Ontario Hydro has made payments for pre-production costs to USX Corporation in advance of the coal deliveries. On cancellation of the Agreement, USX Corporation is not required to refund any outstanding advances. The outstanding advances and associated costs as at the date of cancellation of the Agreement are estimated to be approximately \$85 million. This amount, which was included in "Unamortized advances for fuel supplies" (see note 9), was not charged directly to operations since the Board of Directors under its rate setting authority determined that this cost be deferred and amortized for recovery through electricity rates on a straight-line basis over the period from 1989, the first year such cost can be reflected in rates, through 1993. Accordingly, no amount was charged to operations in 1987.

11. Long-term debt

	1987	1986
	<i>millions of dollars</i>	
Bonds and notes payable.....	24,910	24,390
Other long-term debt.....	154	180
	<hr/>	<hr/>
Less payable within one year.....	25,064	24,570
	1,202	1,076
	<hr/>	<hr/>
	23,862	23,494
	<hr/>	<hr/>

Bonds and notes payable:

Bonds and notes payable, expressed in Canadian dollars, are summarized by years of maturity and by the currency in which they are payable in the following table:

Years of Maturity	1987				1986	
	Principal Outstanding		Weighted Average Coupon Rate		Principal Outstanding	Weighted Average Coupon Rate
	Canadian	Foreign <i>millions of dollars</i>	Total	per cent		
1987.....	-	-	-	-	1,054	-
1988.....	864	318	1,182	-	1,189	-
1989.....	924	772	1,696	-	1,335	-
1990.....	1,031	698	1,729	-	1,770	-
1991.....	1,144	887	2,031	-	2,090	-
1992.....	997	1,010	2,007	-	-	-
1- 5 years.....	4,960	3,685	8,645	11.5	7,438	11.7
6-10 years.....	4,143	1,057	5,200	10.3	5,469	10.8
11-15 years.....	2,620	646	3,266	11.6	3,035	10.9
16-20 years.....	1,901	1,574	3,475	9.9	3,354	10.5
21-25 years.....	1,782	2,291	4,073	11.8	4,456	11.0
26-30 years.....	-	251	251	12.0	638	14.4
	15,406	9,504	24,910	11.1	24,390	11.2

Currency in which payable:		
Canadian dollars.....	15,406	13,926
United States dollars.....	9,483	10,355
United Kingdom pounds sterling.....	21	23
Swiss francs.....	-	86
	24,910	24,390

Ontario Hydro has entered into financial arrangements to hedge a portion of the foreign currency exposure related to principal and interest payments with respect to long-term debt and these arrangements are primarily in short-term forward exchange contracts. These contracts amounted to United States \$641 million and United Kingdom pounds sterling 10 million as at December 31, 1987 (1986 - United States \$744 million and Swiss francs 106 million), having a weighted average Canadian dollar exchange rate of 1.34 and 2.31 respectively (1986 - 1.39 and 0.87 respectively). These financial arrangements hedge principal and interest payments amounting to United States \$335 million and United Kingdom pounds sterling 4 million due in 1988 and the remaining United States \$306 million and United Kingdom pounds sterling 6 million hedge principal and interest payments due over the period 1989 through 1996.

Bonds and notes payable in United States dollars include Canadian \$6,614 million (1986 - Canadian \$7,083 million) of Ontario Hydro bonds held by the Province of Ontario and having terms identical with Province of Ontario issues sold in the United States on behalf of Ontario Hydro. Bonds and notes payable are either held, or guaranteed as to principal and interest, by the Province of Ontario.

Ontario Hydro has entered into interest rate swap arrangements amounting to Canadian \$1,000 million in notional principal as at December 31, 1987 (1986 - Canadian \$350 million), and expiring in 1989 through 1993. These arrangements have effectively converted fixed interest rates on long-term debt, having a weighted average coupon rate of 9.9% (1986 - 9.8%), to variable interest rates which are adjusted quarterly to the prevailing Canadian bankers' acceptance rate.

11. Long-term debt (continued)

Other long-term debt:

	<i>Years of Maturity</i>	<i>Interest Rate</i>	<i>1987</i>	<i>1986</i>
Balance due to Atomic Energy of Canada Limited		<i>per cent</i>		<i>millions of dollars</i>
on purchase of Bruce Heavy Water Plant "A"	1992	7.8	104	121
Capitalized lease obligation for the Head Office building, payable in U.S. dollars	2005	8.0	47	52
Capitalized lease obligations for transport and service equipment	1988 to 1994	6.3 to 11.9	3	7
			<u>154</u>	<u>180</u>

Payments required on the above debt, excluding interest, will total \$114 million over the next five years. The amount payable within one year is \$20 million (1986-\$22 million).

12. Accrued fixed asset removal and irradiated fuel disposal costs

		<i>1987</i>	<i>1986</i>
Accrued fixed asset removal costs			<i>millions of dollars</i>
- accrued decommissioning costs		162	132
- accrued fuel channel removal costs		149	115
		<u>311</u>	<u>247</u>
Accrued irradiated fuel disposal costs		306	243
		<u>617</u>	<u>490</u>

Fixed asset removal costs:

Fixed asset removal costs are the costs of removing certain fuel channels from nuclear reactors which are expected to be replaced during the life of the reactors, and the costs of decommissioning nuclear generating stations and heavy water production facilities after the end of their service lives. The significant assumptions used in estimating fixed asset removal costs were:

- removal of fuel channels in Pickering Nuclear Generating Station "A" units 1 and 2 in the 1984 to 1987 period and units 3 and 4 in the 2000 to 2003 period, Bruce Nuclear Generating Station "A" in the 2002 to 2010 period, Pickering "B" in the 2012 to 2018 period, and Bruce "B" in the 2013 to 2019 period;
 - decommissioning of nuclear generating stations in the 2041 to 2062 period on the deferred dismantlement basis (dismantlement following storage with surveillance for a 30-year period after shutdown of the reactors), and a transportation distance of 1,000 kilometres from nuclear generating facilities to disposal facilities;
 - dismantlement of Bruce Heavy Water Plants "A", "B" and "D" in the 1991 to 2005 period;
 - interest rates through to 2062 ranging from 9% to 10% (1986-9% to 12%); and
 - escalation rates through to 2062 ranging from 4% to 8% (1986-5% to 8%).
- Because of possible changes to the above factors and the methods used for decommissioning and fuel channel removal, these costs are subject to revision. The results of recent tests on a sample of pressure tubes in Pickering units 3 and 4 revealed a trend towards higher than expected

build up of deuterium levels which, together with other technical considerations, could reduce the service lives of the pressure tubes in these units. On March 14, 1987, the Board of Directors decided to advance the retubing of Pickering units 3 and 4 to commence in 1989 and 1991, respectively. The financial impact on the provision for fuel channel removal costs of the change in the timing of the retubing of these units will not be included in operating costs until such change can be implemented on a remaining service life basis from 1989, the first year the change can be reflected in electricity rates, through 1993. The costs of removing the pressure tubes in these units are estimated to be approximately \$144 million, and as of December 31, 1987, the accrued fuel channel removal costs related to these units totalled \$61 million.

Irradiated fuel disposal costs:

The significant assumptions used in estimating the future irradiated fuel disposal costs were:

- an in-service date of the year 2010 for irradiated nuclear fuel disposal facilities;
- a transportation distance of 1,000 kilometres from nuclear generating facilities to disposal facilities;
- interest rates through to the disposal date ranging from 9% to 10% (1986-9% to 12%); and
- escalation rates through to the disposal date ranging from 4% to 7% (1986-5% to 9%).

Because of the uncertainties associated with the technology of disposal, and the above factors, these costs are subject to change.

13. Statement of Source of Cash Used for Investment in Fixed Assets

The Statement of Source of Cash Used for Investment in Fixed Assets reports the investment in fixed assets resulting from the cash flows from operations, financing and other activities, and the effects of changes in cash and cash equivalents and changes in accounts payable and accrued charges affecting investment in fixed assets during the year. This statement focuses on the investment in fixed assets in view of Ontario Hydro's current level of construction activities which are financed from two major sources, cash provided from operations and cash from

financing. Cash from financing represents the amount of cash provided from the issuance of long-term debt and the increase in the level of short-term notes payable issued for debt management purposes, less the amount of cash used to retire long-term debt.

The components of cash provided from operations, investment in other assets, and changes in cash and cash equivalents, defined to be cash and temporary investments net of short-term notes payable issued for cash management purposes, are summarized below.

Cash provided from operations:

	1987	1986
	<i>millions of dollars</i>	
Net Income	271	247
Items not requiring cash in the current year		
Depreciation	723	705
Amortization of foreign exchange gains and losses	93	189
Provision for irradiated fuel disposal costs	36	35
Nuclear agreement—payback	(23)	(63)
Other	37	16
Funds provided from operations	1,137	1,129
Changes in working capital, excluding cash and cash equivalents, and long-term accounts payable affecting operations—decrease (increase)	67	(89)
Cash provided from operations	1,204	1,040

Cash (used for) provided from investment in other assets:

	1987	1986
	<i>millions of dollars</i>	
Advances and related costs for fuel supplies	(11)	(32)
Less repayments and amortization of advances for fuel supplies	35	49
	24	17
Payment related to fuel oil contract settlement (see note 10)	(150)	—
Other	(23)	53
Cash (used for) provided from investment in other assets	(149)	70

Changes in cash and cash equivalents:

	1987	1986
	<i>millions of dollars</i>	
Cash and temporary investments—decrease (increase)	70	(267)
Short-term notes payable issued for cash management purposes—(decrease)	(3)	(218)
Changes in cash and cash equivalents—decrease (increase)	67	(485)

13. Statement of Source of Cash Used for Investment in Fixed Assets (continued)

The reconciliation of the change in fixed assets during the year with the investment in fixed assets for the year is summarized below.

	1987	1986
	<i>millions of dollars</i>	
Change in fixed assets	1,883	1,954
Depreciation of fixed assets in service	717	638
Less depreciation charged to heavy water production and construction in progress	(89)	(84)
	<hr/>	<hr/>
Net book value of fixed assets sold or retired	628	554
Investment in fixed assets	13	15
	<hr/>	<hr/>
	2,524	2,523

14. Pension and Insurance Plans

Ontario Hydro's employee benefit programs include pension and insurance plans. The assets of the pension, group life insurance and long-term disability plans and the changes in assets during the year are shown in the financial statements of The Pension and Insurance Fund, and are not included in Ontario Hydro's financial statements.

Pension Plan:

The change in the accounting policy for pension costs, as described in the Summary of Significant Accounting Policies under "Pension plan", was implemented, on a prospective basis, effective January 1, 1987. The effect of this change has been to increase pension costs for the year ended December 31, 1987 by approximately \$13 million.

The most recent actuarial valuation for accounting purposes of Ontario Hydro's pension plan was performed as at December 31, 1986, using management's best estimate of the following significant assumptions which take into consideration the long-term nature of the pension plan:

- rate used to discount future investment income—9.25%, and future pension benefits—9.25%;
- salary escalation rate—7.75%;
- rate used to estimate ad hoc improvements in pension benefits to partially offset the effect of increase in cost of living—2.88%;
- average retirement age for males—58.8 and for females—59.8; and
- average remaining period of service of the employees—16 years.

Based on this valuation, the actuarial present value of the accrued pension benefits is estimated to be \$2,749 million as at December 31, 1987, and

the pension plan assets available for these benefits were \$3,151 million.

The pension costs for 1987 were \$13 million based on the most recent actuarial valuation for accounting purposes (1986—nil, based on the actuarial valuation for funding purposes as at December 31, 1985). This amount is comprised of Ontario Hydro's current service cost of \$60 million, partially offset by the amortization of \$47 million of the net surplus. In 1987, approximately \$10 million of the pension costs were charged to operations and \$3 million were capitalized.

On October 21, 1986, the Ontario Hydro Employees' Union, Local 1000 of the Canadian Union of Public Employees—C.U.P.E. filed an application for judicial review in the Supreme Court of Ontario to determine whether Ontario Hydro is entitled to apply the pension surplus that has accumulated in Ontario Hydro's pension plan to meet the Corporation's contribution with respect to current service cost. The hearing on this matter was held on February 5, 1987. On March 3, 1987, the Supreme Court rendered its decision that Ontario Hydro has complied with the relevant statutory provisions regarding the corporate contribution towards current service cost. The Ontario Hydro Employees' Union has appealed the court's decision.

Group Life Insurance Plan:

The group life insurance plan had assets of \$31 million as at December 31, 1987 (December 31, 1986—\$33 million). Effective April 1, 1986, the assets are being used to pay the insurance premiums for all members of the plan until such time as the assets are fully utilized.

15. Research and development

In 1987 approximately \$74 million of research and development costs were charged to operations and \$17 million were capitalized (1986—\$59 million and \$20 million, respectively).

16. Comparative figures

Certain of the 1986 comparative figures in the Statement of Cash Used for Investment in Fixed Assets have been reclassified to conform with the 1987 financial statement presentation.

	1987	1986	1985	1984	1983
Revenues					
Primary power and energy			<i>millions of dollars</i>		
Municipal utilities	3,441	3,116	2,891	2,555	2,265
Rural retail customers	968	885	815	712	644
Direct industrial customers	675	604	568	516	448
	5,084	4,605	4,274	3,783	3,357
Secondary power and energy	196	248	351	429	448
	5,280	4,853	4,625	4,212	3,805
Costs					
Operation, maintenance and administration	1,150	1,014	966	884	952
Fuel and fuel-related	1,308	1,089	1,143	1,210	1,169
Depreciation	723	705	655	476	396
	3,181	2,808	2,764	2,570	2,517
Income before financing charges	2,099	2,045	1,861	1,642	1,288
Financing charges					
Gross interest	2,744	2,684	2,551	2,322	2,012
Capitalized interest	(978)	(1,038)	(1,166)	(1,293)	(1,194)
Investment income	(64)	(61)	(60)	(80)	(58)
Foreign exchange	126	213	176	118	56
	1,828	1,798	1,501	1,067	816
Net income	271	247	360	575	472
Financial position					
Total assets	32,657	31,357	29,320	27,301	23,194
Fixed assets	27,986	26,103	24,149	22,147	19,948
Long-term debt	23,862	23,494	22,518	20,659	17,977
Equity	4,962	4,691	4,444	4,084	3,509
Cash flows					
Cash provided from operations	1,204	1,040	1,055	1,088	950
Cash provided from financing	1,330	1,960	757	1,756	1,823
Cash used for investment in fixed assets	2,452	2,585	2,644	2,539	2,668
Investment in fixed assets	2,524	2,523	2,541	2,624	2,746
Financial indicators					
Debt ratio ⁽¹⁾	.836	.835	.830	.833	.840
Cash flow coverage ⁽²⁾	1.08	1.05	1.02	.96	.88
Interest coverage ⁽³⁾	1.10	1.09	1.14	1.25	1.24
Primary energy sales⁽⁴⁾					
Municipal utilities	84,058	80,026	77,011	74,283	70,579
Rural retail customers	16,599	16,279	15,638	14,732	14,006
Direct industrial customers	19,561	18,458	18,011	17,816	16,345
	120,218	114,763	110,660	106,831	100,930
Secondary energy sales⁽⁴⁾	6,515	6,046	8,565	10,627	11,900
Installed dependable peak capacity (megawatts) ⁽⁵⁾	30,080	30,701	28,224	26,612	25,269
December primary peak demand (megawatts)	20,524	20,609	20,473	18,052	18,792
Primary energy made available (millions of kilowatt-hours) ⁽⁶⁾	126,455	120,574	116,049	112,293	106,071

	1987	1986	1985	1984	1983
Number of primary customers⁽⁴⁾					
Municipal utilities	316	316	316	319	320
Rural retail customers	835,925	813,193	795,022	779,748	768,504
Direct industrial customers	108	106	103	105	108
Average revenue⁽⁴⁾	<i>in cents per kilowatt-hour of total energy sales</i>				
Primary power and energy					
Municipal utilities	4.094	3.894	3.754	3.440	3.210
Rural retail customers	6.342	5.901	5.720	5.143	5.027
Direct industrial customers	3.451	3.272	3.155	2.896	2.740
Secondary power and energy	3.008	4.102	4.098	4.037	3.768
All classifications combined	4.211	4.060	3.925	3.586	3.409
Average rate increases	<i>expressed as a per cent</i>				
Municipal utilities	5.2	4.0	8.5	8.0	8.2
Rural retail customers	6.6	3.8	8.7	7.5	8.8
Direct industrial customers	5.6	4.3	8.8	7.6	8.5
All primary customers combined	5.5	4.0	8.6	7.8	8.4
Average cost⁽⁴⁾⁽⁷⁾	<i>in cents per kilowatt-hour of energy generated</i>				
Hydraulic					
Operation, maintenance and administration	.276	.213	.187	.184	.159
Fuel-water rentals	.285	.243	.233	.164	.076
Depreciation and financing charges	.465	.413	.399	.384	.345
	1.026	.869	.819	.732	.580
Nuclear					
Operation, maintenance and administration	.508	.481	.479	.506	.491
Fuel-uranium	.482	.481	.426	.361	.357
Depreciation and financing charges	2.201	2.073	1.889	1.330	1.026
	3.191	3.035	2.794	2.197	1.874
Fossil					
Operation, maintenance and administration	.487	.550	.437	.348	.368
Fuel-coal, gas and oil	2.598	2.746	2.609	2.500	2.417
Depreciation and financing charges	.905	1.367	.997	.597	.586
	3.990	4.663	4.043	3.445	3.371
Average number of employees					
Regular	24,066	23,373	23,001	23,150	24,320
Non-regular ⁽⁸⁾	8,081	9,032	8,135	6,463	6,913

Footnotes

(1) Debt ratio represents debt (bonds and notes payable, short-term notes payable, other long-term debt, and accrued fixed asset removal and irradiated fuel disposal costs less unamortized foreign exchange gains and losses) divided by debt plus equity.

(2) Cash flow coverage ratio represents funds provided from operations plus net interest, and interest charged to fuel for electric generation less interest on accrued provisions divided by interest on bonds, notes, and other debt.

(3) Interest coverage represents net income plus interest on bonds, notes, and other debt divided by interest on bonds, notes, and other debt.

(4) Figures for 1987 are preliminary.

(5) Installed dependable peak capacity represents the net output power

supplied by all generating units, and includes non-operating reserve facilities: 1987-2,667 megawatts; 1986-3,784 megawatts; 1985-3,933 megawatts; 1984-3,999 megawatts; and 1983-3,783 megawatts. Also included are net firm power purchase contracts.

(6) Primary energy made available represents primary energy sales plus transmission losses and energy used for heavy water production and generation projects.

(7) Average cost per kilowatt-hour represents the costs attributable to generation but excludes the costs related to transmission, distribution and corporate administrative activities. These figures reflect the historical accounting costs of operating facilities and the actual energy generated by these facilities during the year.

(8) The majority of non-regular staff are construction tradespersons.

FIVE-YEAR SUMMARY OF STATISTICS - CUSTOMERS SERVED
BY ONTARIO HYDRO AND ASSOCIATED MUNICIPAL UTILITIES

ONTARIO HYDRO

	1987	1986	1985	1984	1983
<i>Total number of customers⁽¹⁾</i>					
Residential	2,860	2,781	2,712	2,652	2,604
Farm	106	106	107	107	108
Commercial and industrial	378	365	354	346	339
	3,344	3,252	3,173	3,105	3,051
<i>Average annual use⁽¹⁾</i>					
Residential	10,960	10,909	10,618	10,590	10,149
Farm	23,540	23,004	22,618	22,556	21,389
Commercial and industrial	218,800	216,666	213,673	212,700	200,436
<i>Average revenue⁽¹⁾</i>					
Residential	5.96	5.63	5.42	5.02	4.69
Farm	6.47	6.00	5.74	5.24	4.87
Commercial and industrial	4.42	4.20	4.03	3.74	3.50

Footnote (1) Figures for 1987 are preliminary.

Board of Directors

J.A. GORDON BELL, Thornhill
Vice-Chairman, Ontario Hydro;
Deputy Chairman, President and Chief
Operating Officer, The Bank of
Nova Scotia

TOM CAMPBELL, Toronto
Chairman, Ontario Hydro
(Retired Jan 18, 1988)

RICHARD E. CAVANAGH, Scarborough
Chairman, Scarborough Public Utilities
Commission

ALAN B. COUSINS, Wallaceburg
Former President,
Ideal Stampings Limited

F. TOM COWAN, Mount Brydges
Farmer, Chimo Farms Ltd., and
Vice-President, Cold Springs
Group of Companies

JOHN B. CRONYN, London
Director, John Labatt Limited

JOHN W. ERICKSON, Q.C., Thunder Bay
Barrister and Solicitor

ROBERT C. FRANKLIN, Toronto
President, Ontario Hydro
(Became Chairman and President
Jan 19, 1988)

ISOBEL HARPER, Toronto
Vice-President,
W.H. Harper Inc.

ALBERT G. HEARN, Agincourt
Former Canadian
Vice-President,
Service Employees
International Union

JAMES S. HINDS, Sudbury
Hinds and Sinclair
Barristers and Solicitors

A.J. MACINTOSH, Q.C., Toronto
Blake, Cassels & Graydon
Barristers & Solicitors

DR. O. JOHN C. RUNNALLS, Toronto
Chairman, Centre for Nuclear
Engineering, and Professor
of Energy Studies,
University of Toronto

JOHN AND M. SAWYER, SIRM, Q.C., MARIE
President and
Chief Executive Officer
Algoma Central Railway
(Retired April 30, 1987)

Officers

CHAIRMAN OF THE BOARD
Tom Campbell

PRESIDENT
Robert C. Franklin

VICE CHAIRMAN
J.A. Gordon Bell

EXECUTIVE VICE-PRESIDENTS
E.H. (Ted) Burdette
Finance and Planning

Sam G. Horton
Human Resources,
Engineering and Services

Arvo Niltenberg
Operations

VICE-PRESIDENTS
R.W. (Ron) Bartholomew
Production

D.B. (Dane) MacCarthy
Marketing

J.G. (John) Matthew
Supply and Services

L.G. (Lorne) McConnell
Power System Program

W.G. (William) Morison
Design and Construction

J.R. (John) O'Connor
Acting Vice-President
Corporate Relations

H.K. (Hal) Wright
Regions

GENERAL COUNSEL AND SECRETARY
L.E. (Larry) Leonoff

TREASURER
Dirk Peper

TIMEKEEPER OF PENSION FUND
Peter de Auer

**CORPORATE COMPTROLLER—
PLANNING AND REPORTING**
Ian R. Russell

**CORPORATE COMPTROLLER—
OPERATIONS**

Bruce L. Bennett

Regional Directors

CENTRAL REGION
C.G. (Gord) Sanford
5760 Yonge Street
Willowdale M2M 3T7

EASTERN REGION
D.A. (Don) Watson
420 Dundas Street East
Belleville K8N 5C3

GEORGIAN BAY REGION
F.A. (Al) Pertula
93 Bell Farm Road
Barrie L4M 1H1

NORTHEASTERN REGION
G.R. (Bud) Barrett
590 Graham Drive
North Bay P1B 8L4

NORTHWESTERN REGION
R.H. (Ron) Stewart
34 Cumberland Street North
Thunder Bay P7A 4L5

WESTERN REGION
Dr. D.A. (David) Drinkwater
1075 Wellington Road
London N6E 1M1

**COMMITTEE REPORTING
TO THE BOARD OF DIRECTORS**

**NORTHERN ONTARIO HYDRO
ADVISORY COMMITTEE**

Dr. W. (Walter) Curklow
Toronto (Chairman)

M. (Mike) Amsden
Timmins

G. (Garnet) Angeconeb
Sioux Lookout

M. (Murray) Atkinson
Thunder Bay

L. (Linda) MacKinnon
Timmins

G. (Gaston) Mallette
Timmins

**Committees of the Board
of Directors**

Finance

T. Campbell (Chairman)

J.A.G. Bell

F.T. Cowan

J.B. Cronyn

R.C. Franklin

J.S. Hinds

AUDIT

J.B. Cronyn (Chairman)

I. Harper (Vice-Chairman)

T. Campbell

R.E. Cavanagh

A.B. Cousins

F.T. Cowan

A.G. Hearn

MANAGEMENT RESOURCES

J.A.G. Bell (Chairman)

T. Campbell

J.B. Cronyn

J.W. Erickson

J.S. Hinds

O.J.C. Runnalls

SOCIAL RESPONSIBILITY

J.W. Erickson (Chairman)

T. Campbell

R.E. Cavanagh

A.B. Cousins

F.T. Cowan

R.C. Franklin

I. Harper

A.G. Hearn

TECHNICAL ADVISORY

O.J.C. Runnalls (Chairman)

T. Campbell

R.E. Cavanagh

J.W. Erickson

R.C. Franklin

I. Harper

A.J. MacIntosh

Design

Haughton Brazeau

Design Associates Limited

Donald L. Copley

Typography

Cooper & Beatty

Toronto, Ontario

Colour Separations

Empress Graphics Ltd.

Scarborough, Ontario

Lithography

Provincial Graphics Inc.

Markham, Ontario



Ontario Hydro

NOV 08 1989

3 1761 115406556 6

